New directions in Psychological Capital research: A critical analysis and theoretical and empirical extensions to individual- and team-level measurement.

by

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Declaration of originality

This thesis contains no material which has been accepted for a degree or diploma by the University or any other institution, except by way of background information duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by any other person except where due acknowledgement is made in the text of the thesis, nor does the thesis contain any material that infringes copyright.

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Statement of authorship

This thesis includes papers for which Sarah Dawkins (SD) was not the sole author. SD conceptualized the papers, completed data collection, analyzed the data and wrote the manuscripts. The contributions of SD and co-authors are detailed below.

1. The paper reported in Chapter 3:

Dawkins, S., Martin, A., Scott, J., & Sanderson, K. (2013). Building on the positives: a psychometric review and critical analysis of Psychological Capital. *Journal of Occupational and Organizational Psychology*. DOI: 10.1111/joop.12007

The contribution of each author:

SD conceptualized the paper, designed and conducted the systematic review and wrote the manuscript.

AM assisted in conceptualizing the paper and the development of the propositions, reviewed and edited multiple drafts of the manuscript and helped with the development of resubmission letters and revisions.

JS reviewed and provided feedback on the final version of the manuscript.

KS reviewed and provided feedback on the final version of the manuscript.

2. The paper reported in Chapter 4:

Dawkins, S., Martin, A., Scott, J., Sanderson, K., & Schüz, B. Maximizing the positives: Criterion validity of lower and higher order factor models of Psychological Capital in relation to wellbeing of SME managers. Submitted to the *Journal of Applied Behavioral Science*, October 2013

The contribution of each author:

SD conceptualized the paper, collected the data, data management and data cleaning and wrote the manuscript. With the guidance of BS she undertook the data analyses and interpretation of the data.

AM assisted in conceptualization of the paper, reviewed and edited multiple drafts of the manuscript.

JS reviewed and provided feedback on the final version of the manuscript.

KS reviewed and provided feedback on the final version of the manuscript.

BS assisted in conceptualization of the paper, advised on data analysis and interpretation, and revised the manuscript.

3. The paper reported in Chapter 5:

Dawkins, S., Martin, A., Scott, J., & Sanderson, K. Advancing the conceptualization and measurement of Psychological Capital (PsyCap) as a collective construct. Invited to revise and resubmit to *Human Relations*, August 2013.

The contribution of each author:

SD conceptualized the paper and wrote the manuscript.

AM assisted in conceptualizing the paper and the development of the propositions, reviewed and edited multiple drafts of the manuscript, and helped with the development of resubmission letters and revisions.

JS reviewed and provided feedback on the final version of the manuscript.

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4. The paper reported in Chapter 6:

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The contribution of each author:

SD conceptualized the paper, collected the data, data management and data cleaning and wrote the manuscript. With the guidance of BS she undertook the data analyses and interpretation of the data.

AM assisted in conceptualization of the paper, reviewed and edited multiple drafts of the manuscript.

JS reviewed and provided feedback on the final version of the manuscript.

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BS assisted in conceptualization of the paper, advised on data analysis and interpretation, and revised the manuscript.

Signed by first named supervisor, Associate Professor Angela Martin:

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Abstract

Background: The construct of Psychological Capital (PsyCap) encapsulates an individual's state of psychological development comprised of the resources of hope, self-efficacy, resilience and optimism (Luthans, Youssef & Avolio, 2007). Research accumulated over the past decade has demonstrated that PsyCap is positively related to a variety of desirable job attitudes and behaviors, and negatively related to undesirable organizational outcomes. However, the literature is currently bereft of critical and systematic analysis of the construct in terms of its theoretical and psychometric foundations at both the individual- and team-levels of analysis.

Aims: This thesis aimed to critically assess the theoretical and psychometric foundations of the PsyCap construct. Additionally, it investigated the added utility of an alternative factor model of PsyCap in relation to criterion variables at the individual-level. The thesis also sought to review and extend current conceptualizations and measurement approaches of PsyCap at higher-levels of analysis (i.e. team-level). Finally, it aimed to compare the relationships between measures using different operationalizations of collective PsyCap and outcomes at the individual- and team-level.

Methods: A systematic review of extant literature was used to provide a comprehensive critical analysis of the PsyCap construct in terms of its theoretical and psychometric properties (Chapter 3). The first empirical study of 193 owner/managers of small-medium-enterprises examined the criterion validity of a four-factor model of PsyCap (compared with the higher-order factor model recommended in prior research) in relation to job satisfaction and job tension

(Chapter 4). A theoretical analysis and development approach was employed to expand the conceptual framework for collective versions of the PsyCap construct (Chapter 5). A second empirical study of 193 employees from a cross-section of industries tested a multilevel model comparing observed relationships between different approaches to operationalizing team PsyCap and indicators of employee and work team performance and functioning (Chapter 6).

Results: The systematic review revealed several theoretical and psychometric shortcomings pertaining to the PsyCap construct. Consequently, six directives are proposed as part of an integrated research agenda aimed at strengthening the conceptualization and measurement of the construct (Chapter 3). A four-factor model of PsyCap provided greater criterion validity in relation to outcome variables at the individual-level than a second-order model, whereby the components of PsyCap were merged into a single factor. A four-factor model also provided greater insight into the differential effects of PsyCap components on job satisfaction and job tension (Chapter 4). Analysis of collective PsyCap research revealed that studies are divergent in their conceptualization and measurement of team-level PsyCap and relatively void of a supporting theoretical model (Chapter 5). This analysis resulted in the development of a multilevel-multireferent framework for conceptualizing different forms of collective PsyCap and a set of eleven testable research propositions to guide future research. Finally, multilevel analyses comparing different compositional models of aggregation to represent team-level PsyCap demonstrated stronger associations between team PsyCap and individual- and team-level outcomes when a referent-shift operationalization of team PsyCap was employed (Chapter 6).

Conclusions: PsyCap has been purported as a measurable and developable positive organizational behavior construct which impacts employee and team functioning. However, review of the construct highlighted critical opportunities for theoretical refinement and psychometric development in order to enhance its utility in the workplace. This critique guided the key contributions of this thesis, fostering greater alignment between theory, conceptualization and operationalization of PsyCap, including expansion to a multilevel approach. This contribution also has implications for the development of training interventions aimed at bolstering team PsyCap. These interventions may not only enhance team performance and functioning, but also individual employee functioning and well-being.

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Ironically, I would not have made it to this point without the positivity and support from a team of remarkable individuals!

First and foremost, I would like to thank my primary supervisor Associate Professor Angela Martin. Your expertise, unlimited support, unwavering belief, and much appreciated optimism and humor were invaluable to me throughout this journey. You always have just the right words to keep me going and strive that little bit harder. I am also grateful to you for making a funded opportunity available which made it possible for me to undertake this PhD. I feel fortunate to have been able to work with you on this project and hope to collaborate again in the future.

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A special thank you to my wonderful family and especially to my husband, Brent and our two beautiful children, Hamish and Camilla; for providing me with endless love, patience and support - and at times, some much needed perspective! I

promise that this is my last stint at being a student and that I will endeavor to get a ‘real’ job now.

Lastly, a special tribute to my treasured sister Jessica, who truly epitomized positivity in everything she took on in her life. Although no longer with us, you continue to inspire me to be all that I can be each and every day.

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OB	Organizational Behavior
POS	Positive Organizational Scholarship
POB	Positive Organizational Behavior
PsyCap	Psychological Capital
CSE	Core Self Evaluations
PCQ	Psychological Capital Questionnaire
I-PCQ	Implicit Psychological Capital Questionnaire
PCI	Psychological Capital Intervention
OCB	Organizational Citizenship Behaviors
TMT	Top Management Teams
CFA	Confirmatory Factor Analysis
HLM	Hierarchical Linear Modeling
$\mathbf{r_{wg}}$	Within Group Agreement Index
SME	Small-to-Medium Enterprise
ICC	Interclass Correlation
EI	Emotional Intelligence
MLGM	Multiple Indicator Latent Growth Modeling
SEM	Structural Equation Modeling
HR	Human Resources
STAT	Swift Starting Action Team
ROI	Return on Investment

Publications

Publications directly arising from the work described in this thesis[1]

Chapter 3:

Dawkins, S., Martin, A., Scott, J., & Sanderson, K. (2013). Building on the positives: a psychometric review and critical analysis of Psychological Capital. *Journal of Occupational and Organizational Psychology, 86*, 348-370. DOI: 10.1111/joop.12007

Manuscripts submitted for peer-reviewed journals

Chapter 4:

Dawkins, S., Martin, A., Scott, J., Sanderson, K., & Schüz, B. Maximizing the positives: Criterion validity of lower and higher order factor models of Psychological Capital in relation to wellbeing of SME managers. Submitted to the *Journal of Applied Behavioral Science,* October 2013.

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Chapter 6:

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[1] As chapters 3-6 of this thesis have been prepared as manuscripts for publication, or submission for publication with peer-reviewed journals minor stylistic nuances may be noted (i.e. use of an active and collective writing voice). Also, as each paper is a standalone piece of writing, some repetition of elements covered in Chapter 1: Literature Review may be evident in the introduction to each paper.

Referred conference presentations using the work described in this thesis

Dawkins, S., & Martin, A. Is It All Positive? A Critical Analysis of the Current State of Psychological Capital Research. Australian and New Zealand Academy of Management (ANZAM) Annual Conference, December 2010, Adelaide, Australia. Oral Presentation.

Awards received from the work described in this thesis

2010 Finalist in the Australian and New Zealand Academy of Management (ANZAM) Best Doctoral Dissertation Proposal Award.

Chapter 1: Literature Review

1.1 Introduction

In order to create a foundation for the studies reported in this thesis, this chapter will provide a review of background positive organizational literature. The contributions of positive psychology will be outlined before comparing two major positive organizational paradigms; Positive Organizational Scholarship (POS) and Positive Organizational Behavior (POB). Although this discussion will highlight aspects of commonality across the two theoretical approaches, it will also draw attention to important distinguishing features including primary research constructs, methodologies and levels of analysis. A detailed overview of individual POB psychological capacities (hope, optimism, resilience and self-efficacy) will then follow, before introducing the central construct of this thesis, Psychological Capital (PsyCap). Particular emphasis will be given to the measurement of the PsyCap construct, its impact on organizational outcomes and potential for development via specialized interventions. A synopsis of nascent research extending the analysis of PsyCap to higher levels (i.e. team-level) will also be provided. Opportunities to further refine the PsyCap construct and expand its applications in research and practice will be highlighted in the development of four research objectives that underpin the studies of this thesis.

1.2 Positivity in the Workplace

Historically, the study of organizational behavior (OB) has followed a similar trajectory to that of psychology and especially clinical psychology; demonstrating a bias towards psychopathology, with an emphasis on deficiencies and *what is wrong* with people (Page & Donohue, 2004). Consequently, the prevailing OB research focus has also been concerned with diagnosis of problems and seeking 'fixes' for

weaknesses. A recent analysis of the leading occupational health journal, *Journal of Occupational Health Psychology*, revealed 94% of articles published between 1996 and 2004 focused on negative issues (Schaufeli & Salanova, 2007). Negative foci included aggression, burnout, discrimination, downsizing, harassment, interpersonal conflict, stress and turnover). Other reviews have reflected similar research bias toward negatively framed phenomena (e.g. Luthans, 2002a; Margolis & Walsh, 2003).

However, alongside the development of the positivity movement within applied psychology, initiated by Seligman and colleagues (Seligman, 1998a, 1998b; Seligman & Csikszentmihalyi, 2000), there has been a shift in the lens through which OB is examined. In contrast with traditional OB approaches, this refocus towards a more positive emphasis has stemmed largely from a desire to enhance the quality of life for individuals who work within, or are affected by organizations (Roberts, 2006). Moreover, organizations are becoming increasingly fluid and less bound by space and time, thanks largely to information technology advancements and globalization, creating a world that is essentially 'flat' (Friedman, 2005). As such, it is argued that a sustainable edge can no longer be achieved by only adopting a deficit approach. Rather, success is achieved by 'thinking outside the square' and looking to paradigms which are strength-based in focus (Luthans & Youssef, 2007). Thus, there is growing recognition within organizational scholarship that a balanced approach is needed which considers both the positive and the negative; building on strengths and correcting weaknesses.

Several paradigms concerned with positivity in the workplace have developed over the past 20 years, including Positive Organizational Scholarship (POS; Cameron & Caza, 2004, Cameron, Dutton & Quinn, 2003) and Positive Organizational

Behavior (POB; Luthans, 2002a, 2002b). Like the broader positive psychology paradigm, these research approaches do not proclaim to have uncovered an entirely new discovery regarding the significance of positivity, nor claim to have a monopoly on positivity (Avey, Luthans & Youssef, 2010). Rather, these approaches are positioned as complementary and provide alternate perspectives on workplace behavior; rather than mere replacements to long-standing OB knowledge and research.

Despite this, recent criticisms have suggested that positively-oriented approaches simply represent a 'rebranding' of already established organizational constructs and phenomena (e.g. Fineman, 2006; Hackman, 2009). Fundamental critics of positively-oriented organizational paradigms claim that such perspectives can be elitist (Klassen, 2001), restrictive and value naïve (Peterson, 1999). In particular, it has been suggested that extreme positivity within the workplace can create overconfidence, unrealistic optimism and false hope among employees (Diener & Biswas-Diener, 2008). In turn, these misperceptions can lead to poorly formed intervention strategies which adversely affect organizational and employee functioning.

In response, proponents have claimed that new generation positively-oriented paradigms provide a contemporary platform to study organizational behavior by integrating established literature with relatively new (to organizational research) positively-oriented theories (Luthans & Avolio, 2009). As such, positively-focused organizational perspectives contribute to developing a more holistic understanding of employee and organizational functioning. However, this is not to deny that these approaches are nascent and work is still required to provide more refined

conceptualizations of positive constructs, mechanisms and outcomes in organizational research (Roberts, 2006).

Attention will now be drawn to the current state of development of the POS and POB paradigms, highlighting similarities and critical areas of distinction between the two perspectives. These conceptual differences are critical in establishing the construct validity of the central construct of interest to this thesis; Psychological Capital (PsyCap). This will be followed by a detailed examination of the POB psychological capacities which comprise the higher-order construct of PsyCap (hope, self-efficacy, resilience and optimism).

1.3 Positive Organizational Scholarship & Positive Organizational Behavior

Although POS and POB have been used interchangeably in the literature (e.g. Hackman, 2009) each has its distinct meanings and research foci (see Figure 1-1). POS is concerned primarily with the study of positive outcomes, processes and attributes of organizations and their constituents (Cameron et al., 2003). The fundamental goal of POS is to understand the mechanisms of positive behavior in the workplace to enable organizations to attain greater levels of success. Consequently, much of the work within the POS paradigm has developed at the organizational-level of analysis (e.g. Bright, Cameron & Caza, 2006; Cameron, 2003; Cameron, Bright & Caza, 2004) and for the most part has focused on the interpersonal and structural dynamics in which positive organizational phenomena manifest.

On the other hand, POB is defined as "the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed and effectively managed for performance improvement" (Luthans, 2002b, p. 59). It has tended to develop from the individual-level (e.g. Luthans, Avolio, Avey & Norman, 2007), but more recently has started to include

team/group (e.g. Clapp-Smith, Vogelgesang & Avey, 2009; Walumbwa, Luthans, Avey & Oke, 2011) and organizational (Avey, Wernsing & Luthans, 2008) levels of analysis.

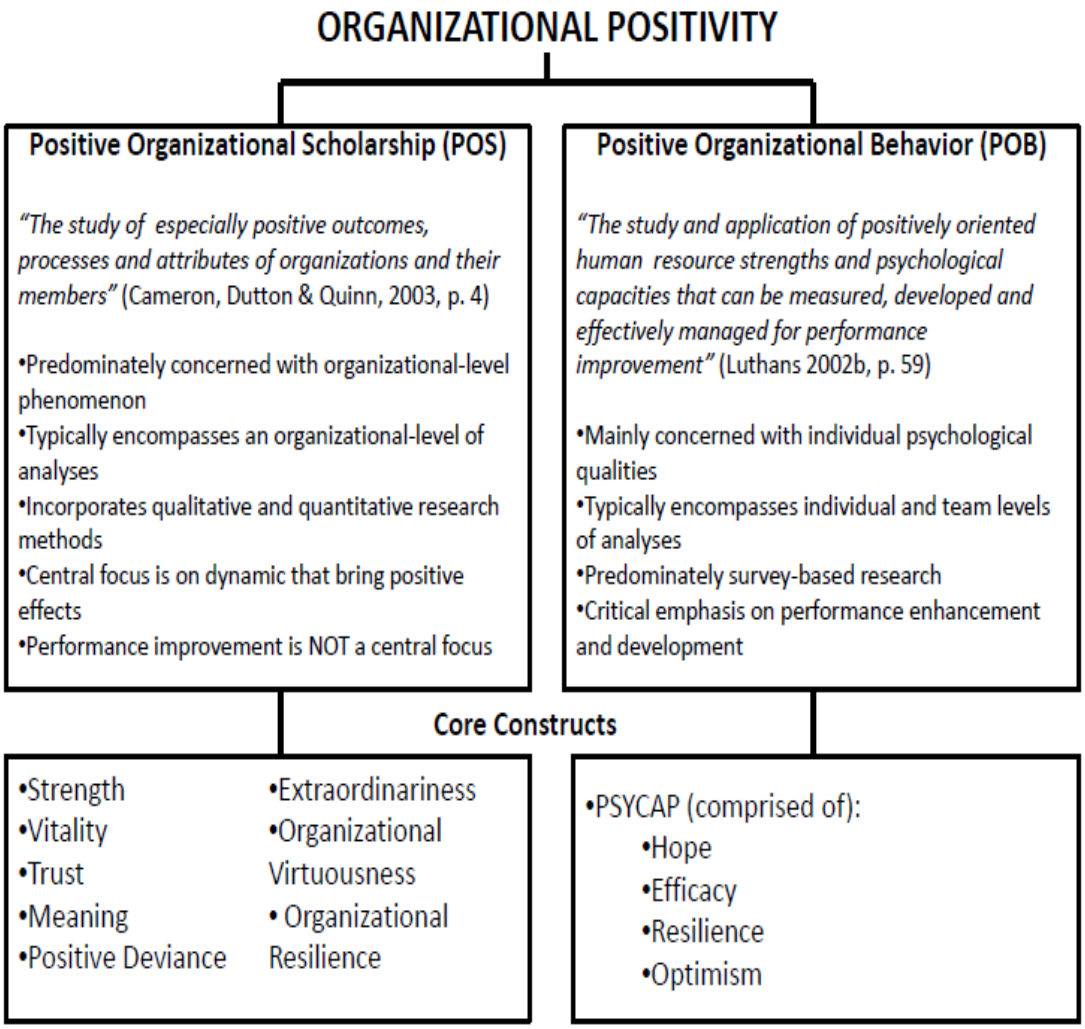

Figure 1-1. Distinguishing features of positive organizational scholarship and positive organizational behavior based on discussions by Donaldson & Ko (2010) and Youssef & Luthans (2011).

POB is differentiated from the general area of positive psychology and POS by its definitional inclusion criteria, which require a psychological capacity to be 1) measurable, 2) open to development, and 3) impactful on work performance. Thus, from a POB perspective a construct needs to have developmental potential and

therefore be considered malleable and 'state-like'. As such, POB constructs are placed towards the state end of a much debated state-trait continuum (Youssef & Luthans, 2011). As shown in Figure 1-2, POB constructs are differentiated from pure traits which are defined as being stable across time and believed to be 'hardwired'(e.g. intelligence; Schmidt & Hunter, 2000). Trait-like characteristics are considered to be relatively stable across time and include constructs such as the Big Five personality traits (Barrick & Mount, 1991) and Core Self Evaluations (CSE; Judge & Bono, 2001). Finally, pure states are positioned at the other extreme of the continuum and include momentary, highly variable states such as moods and emotions.

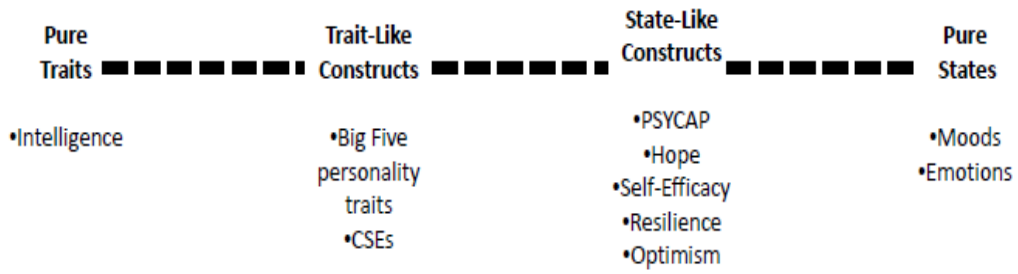

Figure 1-2. The trait-state continuum proposed by Luthans & Youssef (2007)

To date, constructs assessed as best meeting the POB criteria include hope, self-efficacy, resilience and optimism (Luthans, 2002b) and the higher-order construct of PsyCap comprised of these four indicators (Luthans, Youssef & Avolio, 2007). Detailed discussion of each of these constructs and their relationship with performance and other desirable outcomes will be presented in the following sections.

In contrast, the emphasis on individual employee performance and performance enhancement is less central to POS which is more directly concerned

with the positive aspects of the organizational context. Thus, core POS constructs include compassion, positive deviance, vitality and organizational virtuousness (see Cameron, 2003; Spreitzer & Somenshein, 2003; Sutcliffe & Vogus, 2003) - which are less focused on development and potentially less impactful on employee performance.

The two approaches also differ in relation to primary research methods. To date, POB research has largely been conducted at the individual-level of analysis and has exclusively implemented survey-based methodologies. Conversely, POS has focused mainly on the organizational-level of analysis and has employed both quantitative and qualitative research methodologies (Donaldson & Ko, 2010).

In summary, POS and POB share common roots in positive psychology regarding their approach to organizational behavior and functioning. In many respects, the two paradigms are parallel and complementary in nature (Youssef & Luthans, 2011). However, they can be differentiated in terms of their core constructs of interest, emphasis on employee performance and performance development and their foundational focus in terms of levels of analysis.

1.4 POB Psychological Capacities

As outlined above, the four constructs currently deemed to best fit the POB inclusion criteria are *self-efficacy*, *hope*, *optimism*, and *resilience* (Luthans, Youssef et al., 2007). These four constructs are well known within clinical and positive psychology, but have been under-represented in organizational behavior research (Luthans, 2012). Within the POB framework, attention has been devoted to the synergy of these capacities as a core construct, known as Psychological Capital (PsyCap).

As illustrated in Figure 1-3, PsyCap is defined as "an individual's positive psychological state of development, characterized by self-efficacy, optimism, hope and resilience" (Luthans, Youssef et al., 2007, p. 3). PsyCap is not positioned as simply a summation of its individual components, but rather as a higher-order core construct that integrates the four psychological resources synergistically. As a result, PsyCap is theorized as being more impactful on performance and other desirable outcomes than the individual psychological resources that comprise it. That is, PsyCap is conceptualized as being greater than the sum of its parts (Luthans, Youssef et al., 2007).

Before examining the overall PsyCap construct in further detail, including its measurement and demonstrated applications in the workplace, a brief review of each of the individual psychological resources that comprise PsyCap will ensue, with a particular emphasis on how each meets the POB criteria of being *measureable, developable* and *impactful on performance*.

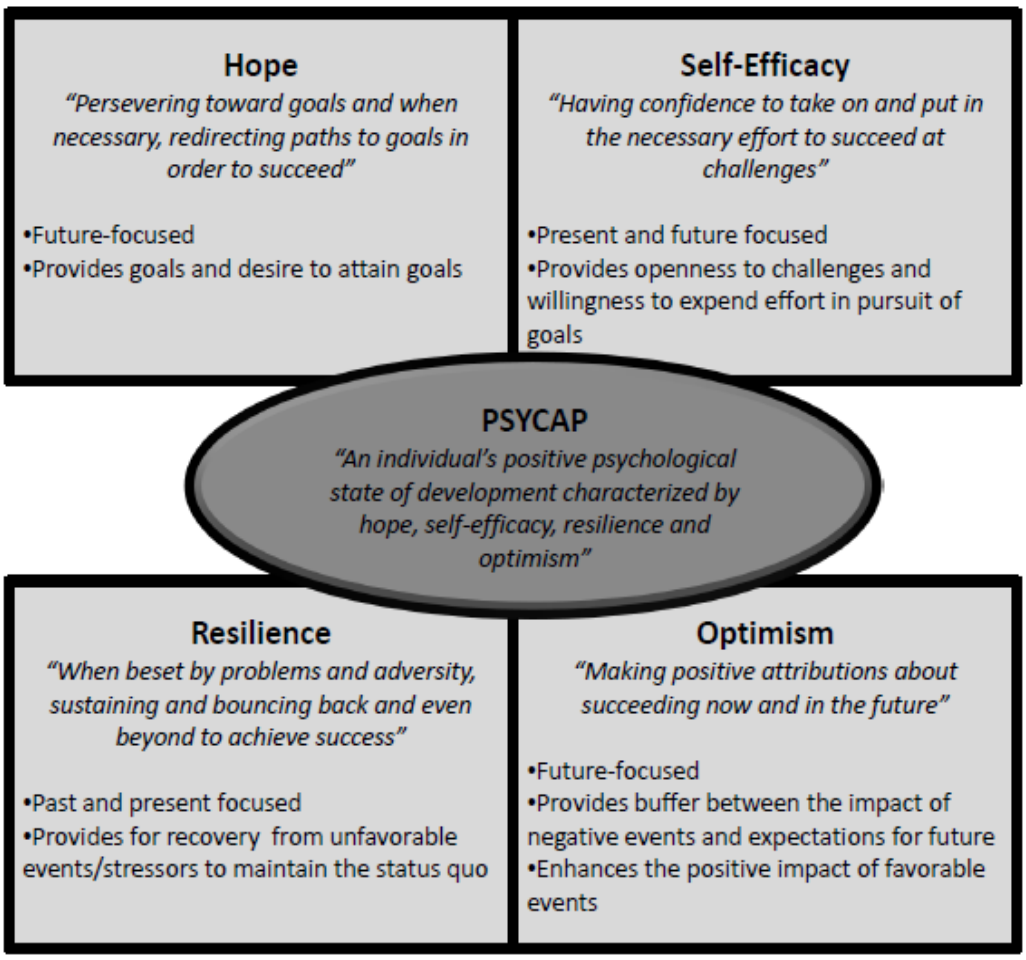

Figure 1-3. A summary of the individual PsyCap components and their contribution to the overall PsyCap construct adapted from Luthans, Youssef & Avolio (2007).

1.4.1 Hope

The inclusion of the hope dimension into the PsyCap concept stems from Snyder's (2000) hope theory. Accordingly, hope is defined as a "positive motivational state that is based on an interactively derived sense of successful a) agency (goal-directed energy) and b) pathways (planning to meet goals)" (Snyder, Irving & Anderson, 1991, p. 287). Thus, individuals are motivated to achieve goals through their sense of agency, which fosters internal determination and willpower to invest the necessary energy to achieve the desired goals. More hopeful individuals are more likely to be motivated by an ability to develop ways to get things that they

want. This in turn allows them to generate alternate pathways to achieve goals if their original pathways become blocked.

Although the agency component ('willpower') of the hope dimension of PsyCap shares similarities with self-efficacy, it is the hope pathways ('waypower') that are unique to PsyCap hope (Youssef & Luthans, 2011). Hope pathways enable individuals to generate alternative strategies to meet goals when faced with obstacles. The pathways element of PsyCap hope also further distinguishes it from everyday use of the term 'hope' in reference to uncertainty (e.g. I *hope* I can do this; Youssef & Luthans, 2011).

Emerging research has shown a positive relationship between employee hope and job performance (e.g. Adams et al., 2003; Luthans, Van Wyk & Walumbwa, 2004), organizational financial performance (Adams et al., 2003; Peterson & Luthans, 2003) and staff retention (Luthans & Youssef, 2004). The hope construct has also been validated across several cross-cultural settings (Luthans, Avolio, Walumbwa & Li, 2005; Youssef & Luthans, 2006).

Although hope has traditionally been conceptualized as a dispositional trait (Snyder et al., 1991) more recent conceptualizations have positioned hope as state-like and therefore malleable and receptive to development. Empirical research has supported the state-like and developable notion of hope (Snyder et al., 2000; Veninga, 2000) and several specific training techniques have been identified as effective in hope development including goal-setting and goal stepping (Latham, 2000).

1.4.2 Self-Efficacy

Founded on self-efficacy theory, particularly social cognitive theory (Bandura, 1997), PsyCap self-efficacy refers to "one's confidence regarding their

ability to activate motivation, cognitive resources, and courses of action needed to successfully execute a specific task in a given context" (Stajkovic & Luthans, 1998b, p. 66). Thus, when individuals have high self-efficacy they are more able and willing to take on challenging tasks and to extend their motivation and effort in order to achieve goals successfully and to persist in the face of adversity. Accordingly, individuals with high degrees of self-efficacy harbor five important characteristics, in that they:

i) Set high goals for themselves and self-select into difficult tasks,

ii) Embrace and flourish on challenge,

iii) Are self-motivated,

iv) Invest the necessary effort to accomplish goals; and

v) When faced with obstacles they persevere (Luthans, Youssef et al., 2007, p. 38).

Self-efficacy has been found to be highly correlated with many desirable organizational outcomes including job performance and satisfaction. For instance, a meta-analysis of over 100 studies found that self-efficacy had a .38 correlation with work-related performance (Stajkovic & Luthans, 2003). Additionally, self-efficacy is negatively related to job stress (Matsui & Onglatco, 1992) and turnover intentions (Harris & Cameron, 2005).

Research has consistently demonstrated that self-efficacy is open to development and therefore state-like in nature. In particular, studies have shown that self-efficacy can be enhanced via experiences of mastery, vicarious learning and positive feedback (e.g. Bandura, 1997, 2000; Luthans, Luthans & Luthans, 2004; Luthans & Youssef, 2004; Stajkovic & Luthans 1998a, 1998b).

1.4.3 Resilience

PsyCap resilience is described as the ability to bounce back to attain success when beset by problems and adversity (Luthans, Youssef et al., 2007, p. 3). Thus, resilience differentiates between individuals who recover well following adversity and those who remain stalled and unable to progress (Block & Kreman, 1996). It has also been suggested that resilience can provide the capacity to rebound to levels at, or even beyond previous functioning (Richardson, 2002).

Much of the research to support the inclusion of resilience in the PsyCap construct is derived from clinical psychology intervention research concerned with developing personal assets and minimizing risk factors. It is suggested that resilience allows individual and environmental protective factors (assets) to operate by reducing the risk factors within an individual and/or their environment (Masten, 2001). Protective factors or 'resilience assets' refer to measurable characteristics that predict positive future outcome and/or adaption to adverse situations (Masten & Reed, 2002). In the workplace these assets may include factors such as cognitive ability, temperament, a positive outlook on life, spirituality, a sense of humor, emotional stability and initiative. Conversely, resilience risk factors are measureable characteristics that predict negative outcomes or poor adjustment and include workplace-relevant factors such as stress and burnout, lack of knowledge and training and unemployment.

The asset/risk factor relationship in the resilience process is not considered linear in nature. Thus, resilience cannot simply be 'calculated' by totaling the resources available minus the number of risk factors. Rather, assets and risks need to be considered as cumulative and interactive; as such the sequence in which risks and

assets occur or develop can be important in predicting an individual's resilience level (Sandau-Beckler, Devall & de la Rosa 2002).

Resilience shares some similarities with the other PsyCap components. For example, perseverance is shared with self-efficacy; while adaptive processes are common to hope and resilience; and the balance between external and internal resources is central to both the resilience and optimism components of PsyCap (Youssef & Luthans, 2011). However, as indicated in Figure 1-3, the direction of resilience distinguishes it from the other three components; in that it is reactionary and past-focused in nature.

Although it has been long established within both clinical and positive psychology that resilience can be dispositional and thus 'trait-like', there is also evidence to demonstrate that it is state-like and open to development (e.g. Bonanno, 2005; Coutu, 2003). Human resource development research has further supported the state-like nature of resilience via training interventions aimed at enhancing resilience in the workplace (e.g. Luthans, Vogelgesang & Lester, 2006; Reivich & Shatte, 2002; Waite & Richardson, 2004).

Resilience has been identified as a critical factor in many aspects of human functioning, including post-trauma coping and recovery (e.g. Block & Kremen, 1996; Bonanno, 2004; Coutu, 2003). Relevant to the workplace, resilience has been found to be positively associated with job performance (Luthans et al., 2005) and organizational commitment (Youssef & Luthans, 2007). Additionally, resilience is reported to be significantly related to broad indicators of employee well-being including job satisfaction (Youssef & Luthans, 2007) and job tension (Tugade & Fredrickson, 2004).

1.4.4 Optimism

PsyCap optimism leverages from positive psychology and particularly the seminal work of Seligman (1998a, 2002). Optimism is conceptualized as a two dimensional construct in terms of: 1) the degree of permanence (e.g. negative events are perceived as temporary and positive events are perceived as permanent); and 2) pervasiveness (e.g. negative causes are viewed as specific to an event and not applicable to all events, and positive causes are viewed in the reverse fashion). Thus, optimism incorporates a positive explanatory style whereby individuals attribute positive events directly to internal, permanent and pervasive causes; while attributing negative events to temporary, external, situation-specific factors (Seligman, 2002). Accordingly, highly optimistic individuals apply personal credit for favorable events which in turn increases feelings of self-confidence. Similarly, these individuals distance themselves from less favorable events, thus protecting them from feelings of depression, guilt and self-blame (Luthans & Youssef, 2004).

Although optimism shares characteristics with self-efficacy and hope (e.g. positive internalization) it is unique in terms of its scope and agency (Youssef & Luthans, 2011). Optimism encompasses a broader scope as it includes overarching positive future expectation; as opposed to being context specific (PsyCap self-efficacy) or goal-specific (PsyCap hope). Additionally, optimism utilizes both internal and external attributions; whereas self-efficacy and hope are solely internally derived (Youssef & Luthans, 2011). These external attributions are considered particularly important in order for individuals to maintain positivity following setbacks or failure.

In order for optimism to be considered a psychological resource from a POB perspective it must be both *realistic* and *flexible* in nature. Realistic optimism refers

to a positive outlook that is not an unchecked process but rather encompasses a pragmatic assessment of a given situation. In comparison, unrealistic optimism exposes individuals to greater risks as consequences of actions are often underestimated and risk factors externalized (Luthans, Youssef et al., 2007). Flexible optimism reflects an individuals' ability to correctly appraise a situation and then choose an appropriate corresponding explanatory style (e.g. optimistic or pessimistic). Thus, effective optimism needs to be balanced in relation to the internalization of success and the externalization of failure.

Optimism has been theorized to have both trait-like and state-like characteristics. For example, optimism has been shown to remain relatively stable within individuals across both time and context (Carver & Schier, 2002; Schulman, Keith & Seligman, 1993). However, Seligman (1998a) demonstrated that although individuals tend to have fixed ranges in relation to their degree of optimism, individuals can learn to operate towards the higher end of their range. This capacity for 'learned optimism' demonstrates state-like characteristics of optimism and thus lends support for its inclusion in the PsyCap model (Larson & Luthans, 2006).

Specifically, optimism can be developed by either altering a pessimistic explanatory style or enriching the dimensions of an optimistic explanatory style. Schneider's (2001) three-step process which includes 1) leniency for the past; 2) appreciation for the present; and 3) opportunity seeking for the future is particularly relevant to PsyCap optimism development. According to this process, individuals need to be able to carefully evaluate the impact of harboring negative feelings associated with past experiences or situations on their ability to appreciate and learn from the positives of the situation and inhibit future (calculated) risk taking.

Research has demonstrated positive associations between optimism and work-related performance. Seligman (1998a) reported that optimistic sales representatives outsold their more pessimistic colleagues by at least 37%. Additionally, optimism has been found to be a critical moderating factor in the relationship between job characteristics and job strain with optimistic employees less likely to experience symptoms of workplace stress (Totterdell, Wood & Wall, 2006).

1.5 PsyCap: A Higher-Order Construct

Although each of the individual positive psychological capacities reviewed above has been studied individually for their POB potential, substantially greater attention is now being devoted to the higher-order core construct, known as Psychological Capital (PsyCap). PsyCap has been differentiated from previous concepts of capital, such as human capital (*"what you know"*), social capital (*"who you know"*), and financial capital (*"what you have"*); as it is concerned with what you can become in terms of positive psychological development (Luthans, Youssef et al., 2007, p. 10).

As summarized in Figure 1-3, PsyCap is formally defined as a higher-order construct derived from a constellation of motivational and behavioral tendencies associated with self-efficacy ("having confidence to take on and put in the necessary effort to succeed at challenging tasks"); hope ("persevering towards goals and when necessary redirecting paths to goals"); optimism ("making a positive attribution about succeeding now and in the future"); and resilience ("when beset by problems and adversity, sustaining and bouncing back and even beyond to attain success") (Luthans, Youssef et al., 2007, p. 3).

Confirmatory factor analyses have demonstrated support for a core underlying factor, whereby the shared variance or commonality between each facet

comprises the higher-order factor, PsyCap (Luthans, Avolio et al., 2007). Additionally, PsyCap proponents have reported that the higher-order construct of PsyCap produces higher correlations with performance outcomes than any of its individual components alone (Luthans, Avolio et al., 2007). Similar findings have been reported in relation to other outcomes including job satisfaction and absenteeism (Luthans et al., 2005; Avey, Patera & West, 2006).

It is suggested this 'synergistic effect' occurs because PsyCap incorporates the coping mechanism(s) that the four factors have in common (Avey, Reichard, Luthans & Mharte, 2011). This mechanism is attributed to psychological resource theory (Hobfoll 2002), whereby it is suggested that some constructs (i.e. hope, self-efficacy, resilience, optimism) are indicators of broader, multidimensional 'core' factors (i.e. PsyCap). Thus, although individual constructs may be psychometrically valid in their own right, they can also be considered as 'markers' of an overarching multidimensional core construct. To help illustrate this theoretical position, Avey, Reichard et al. (2011) draw parallels with other organizational behavior constructs including core self evaluation traits (Judge & Bono, 2001), transformational leadership (Antonakis, Avolio & Sivasubramaniam, 2003) and empowerment (Spreitzer, 1995) where each construct is considered a second-order factor consisting of shared variance between individual predictive components.

1.6 PsyCap Measurement

In order to meet the POB criterion of being *measurable* the development of psychometrically sound instruments to assess PsyCap has been a central aspect for POB research. In constructing a workplace specific PsyCap measure, Luthans, Youssef et al. (2007) drew from recognized, published measures for self-efficacy (Parker, 1998); hope (Snyder et al., 1996); optimism (Scheier & Carver, 1985) and

resilience (Wagnild & Young, 1993). Given that those measures varied in terms of number of items and Likert scale points, as well as the degree to which they were state-like and relevant to the workplace, some items were modified or eliminated. As a result, a 24-item measure, known as the Psychological Capital Questionnaire (PCQ; Luthans, Youssef et al., 2007) has been developed. A composite PsyCap score is calculated by summing the scores from the 24 items, with higher scores indicating more positive PsyCap. Permission to use the measure is available for research purposes free of charge at www.mindgarden.com.

Although each of the individual scales from which the PCQ items were developed had been independently validated, efforts to establish psychometric support for the PCQ have also been made (e.g. Luthans, Avolio et al., 2007). A critical assessment of this research underlies the first research question of this thesis and forms part of the basis of the systematic review presented in Chapter 3.

Research Question 1: What are the theoretical and psychometric foundations of the PsyCap construct and its primary measure the PsyCap Questionnaire (PCQ) and are there aspects that warrant further research and development?

Furthermore, despite emerging psychometric support for the PCQ and modified versions of the measure, the need for continued research is also recognized. Specifically, PsyCap proponents acknowledge that greater research is needed to establish the nomological network representing the construct validity of PsyCap (Luthans, Avey, Avolio & Peterson, 2010). Additionally, they concede that the methods used to construct the PCQ, by which items were borrowed from published measures and modified to relate to the workplace, may undermine the construct validity of the PCQ. Consequently, further measurement refinement is needed so to enhance the construct validity of PsyCap.

Moreover, there is some question regarding the efficacy of implementing a composite PsyCap score. Although psychometric support for a second-order model of PsyCap (and thus the use of a composite score) has been reported (Avey, Luthans & Youssef, 2010; Luthans et al., 2010; Luthans, Avolio et al., 2007), other research has highlighted that greater variance can be explained in dependent variables when PsyCap components are analyzed individually (Rego, Marques, Leal, Sousa & Cunha, 2010). This may mean that examination of the PsyCap components individually, rather than using a composite PsyCap score provides greater insight into the *mechanisms of effect* of PsyCap[1]. In turn, this could allow for the development of tailored intervention programs aimed at enhancing individuals' PsyCap which meet the specific needs of the employee and their organization. These issues underpin the second and third research questions of the thesis and form the central focus of the study presented in Chapter 4. Specifically, this study compares the criterion validity of a four-factor model of PsyCap with the second-order model typically used in PsyCap research in relation to job satisfaction and job tension at the individual-level.

Research Question 2: Does a four-factor model of PsyCap (where hope, efficacy, resilience and optimism are considered separately) offer greater utility in explaining variance in outcome variables compared to the conventional second-order model of PsyCap?

Research Question 3: Do the individual PsyCap factors (hope, efficacy, resilience and optimism) differentially explain variance in outcomes variables and thereby offer insight into the mechanisms of effect of PsyCap?

[1] The terms 'mechanism of effect of PsyCap' and 'effect mechanisms of PsyCap' are used interchangeably throughout this thesis to refer to the differential relationships each of the individual components of PsyCap may have with outcome variables. As such, the terms as they are used here, are not intended to imply a mediation model of effect.

1.7 PsyCap Development

As noted earlier, a definitional criterion for POB constructs is openness to development. This has been emphasized in the review of the individual components of PsyCap in this chapter which cited research and specific approaches relating to the development of each of the PsyCap strengths. Based on this research, a micro-intervention aimed at enhancing individuals' level of PsyCap has been developed. The PsyCap Intervention (PCI: Luthans, Avey, Avolio, Norman & Combs, 2006) has been empirically assessed, in both online (Luthans, Avey & Patera, 2008) and in-house delivery formats (Luthans et al., 2010). Initial evidence has demonstrated significant increases in PsyCap via these brief training interventions, with small to medium effect sizes reported (d = .31-.40; Luthans et al., 2010). As controlled experimental methodologies were employed, this research suggests that PsyCap training has a causal impact on improving participants' performance (Luthans et al., 2010).

The PCI model (summarized in Figure 1-4)[2] has been developed with three primary goals: (1) to be brief in duration and thus minimize disruption to the workplace; (2) to enhance each of the four dimensions of PsyCap; and (3) to enhance overall PsyCap through integration of the underlying principles and developmental aspects of each of the four individual PsyCap resources (Luthans et al., 2010). Thus, the intervention focuses on the development of each individual state of PsyCap, as well as overall PsyCap.

Specifically, the PCI involves a series of exercises specific to each individual component of PsyCap, along with more integrative reflective exercises which are aimed at incorporating the development of the individual component training into an

[2] For a more in depth overview of PCI training exercises and how these theoretically relate to each of the PsyCap dimensions, see Luthans, Youssef et al. 2007, chapter 8.

understanding and operationalization of overall PsyCap (Luthans et al., 2010). For instance, employees are asked to consider a personally meaningful work goal. In identifying this goal, the employee is assisted by the facilitator to phrase the goal so as to enhance 'agentic capacity' (Bandura, 2008) and to 'step' goals into manageable units (Snyder, 2000). The employee is then guided to generate several pathways that could enable them to achieve this goal. Luthans et al. (2010) outline that a critical element of the PCI delivery is facilitated small group discussions; thus employees are encouraged to share their goals and pathways with the group in order to generate additional pathways and model positive goal setting behavior to the group.

This bi-directional group process of vicarious learning and modeling is posited to further enhance participants' level of self-efficacy through the generation of additional pathways to achieve their stated goal; while also enhancing their positive expectations (optimism) to achieve it. In addition, it is theorized that the generation of multiple pathways for goal achievement increases participants' resilience as it enables them to 'bounce back' by selecting an alternative pathway, if an original pathway is blocked or met with challenge (Luthans et al., 2010).

The final element of the PCI is directed towards optimism development by increasing participants' self-awareness of negative cognitions they may possess when faced with a challenge or problem at work. The optimism development phase of the PCI is based upon cognitive-behavioral theory that posits that people tend to make automatic, unfounded, negative cognitions when confronted with problems or challenges, which in turn generates negative behaviors (e.g. *"This is hopeless, I can't possibly complete this report by the deadline. I give up!"*). The PCI optimism development phase aims to counter negative cognitive distortions by encouraging participants to identify and challenge negative cognitions and replace these with

more positively oriented and realistic expectations (e.g. *"This report is going to take a lot of work, but I have done similar reports before and can do this one if I keep working at it"*).

In addition to research establishing the efficacy of the PCI in relation to enhanced PsyCap and improved job performance (Luthans et al., 2010), PsyCap proponents have also reported a quantifiable return on investment for the PCI. Preliminary utility analyses have estimated robust return of investment (ROI) in excess of 200% (see Luthans, Youssef et al., 2007 for detailed quantitative utility analysis based on varying corporate data).

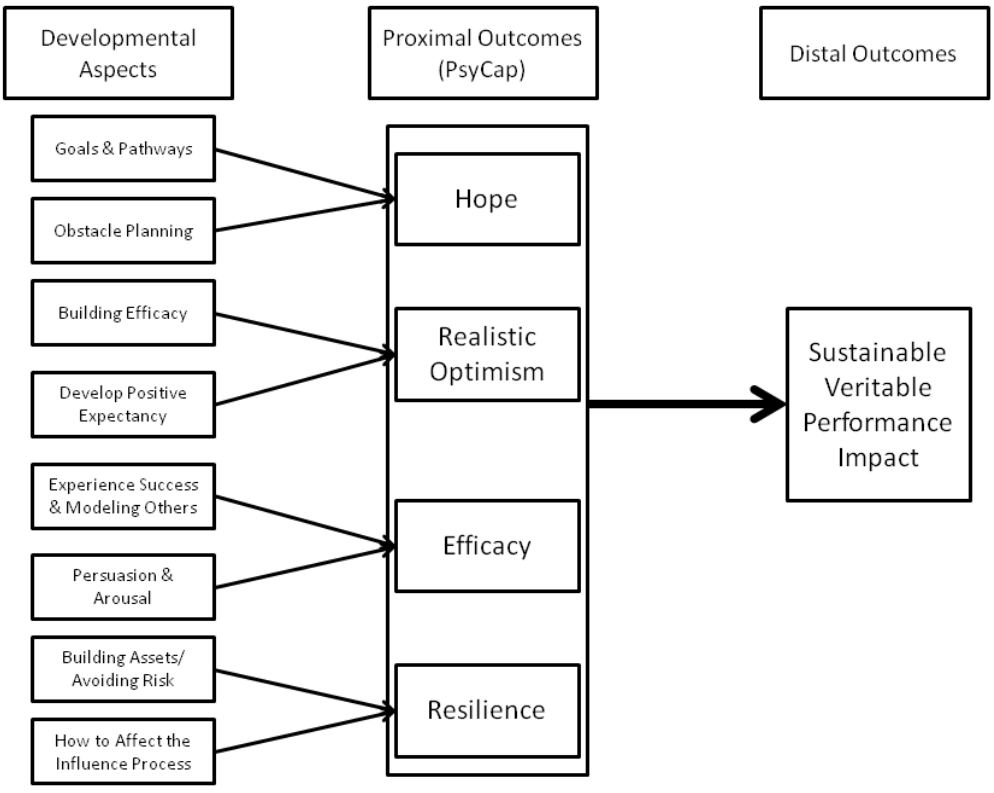

Figure 1-4. Overview of the Psychological Capital Intervention. Adapted from Luthans, Avolio et al., 2006; also found in Luthans, Youssef et al., 2007; Luthans et al., 2010

1.8 PsyCap and Organizational Outcomes

Consistent with POB criteria, PsyCap has been purported as a resource that can be leveraged for organizational competitive advantage (Luthans, Youssef et al., 2007). As such, concerted research has been conducted to demonstrate the utility of PsyCap; particularly in relation to employee performance and functioning (see Avey, Reichard et al., 2011). This research has demonstrated manifold positive effects of PsyCap, even after controlling for demographic factors, personality traits (e.g. core self-evaluations) and employee/organization and employee/job fit analyses (Youssef & Luthans, 2011). Specifically, PsyCap is reported to be positively related to both employee-rated job performance (e.g. Avey, Avolio & Luthans, 2011; Luthans, Avey, Clapp-Smith & Li, 2008; Luthans, Avolio et al., 2007; Luthans et al., 2005; Luthans, Norman, Avolio & Avey, 2008; Rego et al., 2010); and objective or manager-rated employee job performance (Luthans et al., 2010; Peterson, Luthans, Avolio, Walumbwa & Zhang, 2011).

Additionally, PsyCap has been positively associated with other desirable employee attitudes and behaviors including job satisfaction (Cheung, Tang & Tang, 2011; Larson & Luthans, 2006; Luthans, Avolio et al., 2007), organizational commitment (Avey, Luthans & Jensen, 2009; Larson & Luthans, 2006), psychological well-being and work-related happiness (Avey, Luthans, Smith & Palmer, 2010; Culbertson, Fullagar & Mills, 2010), and organizational citizenship behaviors (OCBs; Avey, Luthans & Youssef, 2010; Gooty, Gavin, Johnson, Frazier & Snow, 2009).

Research has also demonstrated negative associations between PsyCap and undesirable employee attitudes and behaviors including cynicism and intent to quit (Avey, Hughes, Norman & Luthans, 2008; Avey et al., 2009; Avey, Luthans &

Youssef, 2010; Avey, Wernsing et al., 2008), absenteeism (Avey et al., 2006) and workplace deviance (Avey, Wernsing et al., 2008; Norman, Avey, Nimnicht & Pigeon, 2010).

However, although there is support for the PsyCap construct and its efficacy in terms of enhancing employee performance and functioning and HRD development, it is also evident that much of the published PsyCap research has been conducted by the founding PsyCap research team (e.g. Luthans, Avey, Avolio, Youssef). For instance of the 14 studies included in a recent meta-analysis of PsyCap research (Avey, Reichard et al., 2011), nine were first authored by Luthans or Avey; with only a single study (Gooty et al., 2009) published by a team independent of founding PsyCap researchers.

Cautions have been raised in relation to new research paradigms which can run the risk of collective acceptance from those working in the field. Hackman (2009) warns that paradigms can suffer endorsement so strong that potential viable alternatives to studying the phenomenon are overlooked. Similarly, same-team replication studies and reviews can promote spurious confirmation or endorsement of findings due to allegiance and subsequently original discoveries are taken for granted and propagated as fact (Ioannidis, 2012). Therefore, although the first decade of PsyCap scholarship has been promising, it is important that future research and critical analysis be conducted beyond the core founding research team to ensure the longevity of the construct and extend its applications within organizational behavior.

1.9 Extending the Application of PsyCap to Higher Levels of Analysis

As discussed above, research has shown PsyCap to be related to an array of important outcomes. However, these findings should be viewed as "first steps" and a challenge for future research is to explore alternate approaches to assessing and

developing PsyCap in various contexts and at multiple levels of analysis (Youssef & Luthans, 2011, p. 357). In response, a small number of studies have begun to investigate the notion of collective PsyCap. This research has concentrated on collective PsyCap at the team-level; demonstrating that team-level PsyCap is positively related to team performance (Clapp-Smith et al., 2009; Peterson & Zhang, 2011; Walumbwa et al., 2011) and team organizational citizenship behaviors (Walumbwa et al., 2011).

Although the progression of investigating PsyCap at higher levels of analysis is underway, many untapped research opportunities remain. For instance, the need for future collective PsyCap research to consider not only the presence of various levels of analysis, but also the interaction across these levels has been identified (Youssef & Luthans, 2011). To date, the notion of collective PsyCap has only been investigated in relation to collective (i.e. team) outcomes and functioning, with no published studies examining how collective PsyCap may influence individual employee performance and functioning. Multilevel research allows for consideration of the consequences of behaviors traversing organizational levels (i.e. across levels; Hitt, Beamish, Jackson & Mathieu, 2007). Thus, a richer understanding of social phenomena, including collective PsyCap, can be developed by going beyond a single level of analysis. As such, Chapter 6 represents the first truly multilevel (Bliese & Jex, 2002) PsyCap study, as it investigates associations between team-level PsyCap and both team-level and individual-level outcomes (see research question 5 below).

Additionally, potential remains in regards to the theoretical foundations for collective versions of PsyCap. Current studies are divergent in their conceptualization and corresponding measurement approaches to collective PsyCap and in some cases, there appears to be a distinct misalignment between

conceptualization and measurement (e.g. Clapp-Smith et al., 2009; Peterson & Zhang, 2011). Moreover, collective PsyCap research to date is virtually devoid of any in-depth theoretical analysis to demonstrate why and how PsyCap manifests at the collective level. The absence of such an analysis heightens the risk for further measurement misalignment and tenuous research findings; and makes future collective PsyCap research vulnerable to criticism and disparagement. Detailed discussion of these issues, along with a review of extant collective PsyCap research is presented in a theoretical analysis in Chapter 5 and addresses the fourth research question of the thesis. This is followed by an empirical comparison of two different measurement approaches of collective PsyCap in the multilevel study presented in Chapter 6. Thus, this study also addresses the final research question of the thesis by determining the most appropriate conceptual and measurement model of team-level PsyCap in relation to outcomes at both the individual- and team-level.

Research Question 4: What are the current theoretical frameworks to support the extension of PsyCap to the team-level and are there areas for further development in relation to the conceptualization, operationalization and measurement of PsyCap at the team-level?

Research Question 5: How does team-level PsyCap relate to outcomes at both the team-level (e.g. team performance, satisfaction and conflict) and the individual-level (job satisfaction and turnover intentions)?

Research Question 6: Which compositional model of team-level PsyCap (e.g. direct-consensus composition or referent-shift composition) is most viable in terms of predicting outcomes at the individual- and team-level?

1.10 Summary

Positive organizational behavior (POB) has been introduced as a new paradigm through which to study workplace behavior and functioning. Its key construct, PsyCap (concerned with an individual's state of positive psychological development characterized by hope, self-efficacy, resilience and optimism) has attracted steady research growth over the past decade. Much of this research has been concerned with investigating relationships between PsyCap and indicators of employee performance and functioning. Consequently, a measure for PsyCap (PCQ) has been developed and some preliminary psychometric for the construct has been reported (e.g. Luthans, Avolio et al., 2007). Recent meta-analytic evidence suggests PsyCap is an important predictor of job performance and satisfaction, organizational commitment, organizational citizenship behavior (OCB), turnover intentions and psychological well-being (Avey, Reichard et al., 2011). Additionally, PsyCap has also been shown to be receptive to development and management through relatively short training interventions (Luthans, Avey et al., 2006; Luthans et al., 2010). Finally, emerging research is investigating PsyCap at higher levels of analysis which has indicated that the positive effects of PsyCap can also be observed at the team-level (e.g. Walumbwa et al., 2011).

Despite the recognized relationship PsyCap has with important work-related outcomes, it is a relatively new construct and as such, it warrants further scrutiny. Moreover, given the previously outlined pitfalls associated with same-team validation and replication studies (Hackman, 2009; Ioannidis, 2012), there is an apparent need for some of this critical inquiry to develop outside of the core PsyCap authorship team. In particular, a systematic analysis of the PsyCap construct in terms of its theoretical foundations and psychometric profile is needed. Such research will

serve to strengthen the conceptualization and measurement of PsyCap and contribute to its overall psychometric development. This will in turn, increase the utility of the construct in both research and practice.

Additionally, there is a need to further investigate the factor structure of PsyCap as it is currently conceptualized. Although there is evidence to support a second-order model of PsyCap, research has also suggested that greater understanding regarding PsyCap's mechanisms of effect may be garnered when implemented as a four-factor model (Rego et al., 2010). Thus, examination of the factor structure of PsyCap in relation to the prediction of important work-related outcomes could shed light on the contribution of each of the PsyCap subcomponents in the prediction of specific outcomes. This line of inquiry may not only enhance understanding regarding PsyCap's mechanisms of effect, but also help to inform the design of tailored intervention programs aimed at enhancing individual PsyCap which meet the specific needs of the employee and their organization.

In addition to research pertaining to the psychometric foundations of PsyCap, there is also a need for greater exploration into the practical applications of the construct. Despite the growth in published studies over a relatively short period of time, PsyCap research has tended to be narrow in scope (Avey, Reichard et al., 2011). One recognized avenue for extending the utility of PsyCap is the investigation of a collective version of the construct (Youssef & Luthans, 2011). Although initial research has begun in this area (e.g. Clapp-Smith et al., 2009; Walumbwa et al., 2011) there has been little theoretical analysis regarding the emergence of PsyCap at higher levels. Furthermore, to date there has been no analysis of potential cross-level effects of collective PsyCap on individual-level performance and functioning. Attention to these areas will help to clarify the conceptualization and

operationalization of PsyCap at higher levels and may also offer important insights for management practice in terms of the benefits of fostering collective PsyCap to enhance both team and employee work-related functioning and well-being.

1.11 Contributions of the Program of Research to Theory and Practice

This thesis aims to address a series of research questions presented in the preceding review of the PsyCap literature and which are summarized in Figure 1-5. As such, the following studies will contribute to improved understanding of the PsyCap construct; particularly in regards to its theoretical and psychometric foundations and its potential as a meaningful multilevel construct. More specifically, it is anticipated that investigation of each of the research questions will provide multiple unique and meaningful contributions to theory and practice. These are outlined below:

Research Question 1: What are the theoretical and psychometric foundations of the PsyCap construct and its primary measure the PsyCap Questionnaire (PCQ) and are there aspects that warrant further research and development?

Investigation of the theoretical and psychometric foundations of the PsyCap construct and its primary measure provides opportunity to improve and refine the conceptualization and measurement of PsyCap. From a research perspective, this will help to further establish PsyCap as a meaningful OB construct as it will serve to differentiate PsyCap both conceptually and psychometrically from other seemingly similar OB constructs. Improvements in PsyCap measurement will also provide managers and HRD specialists with more accurate assessment of employee PsyCap. This in turn, would allow for more precise identification of the need for and utility of PsyCap interventions for staff.

Research Question 2: Does a four-factor model of PsyCap (where hope, efficacy, resilience and optimism are considered separately) offer greater utility in explaining variance in outcome variables compared to the conventional second-order model of PsyCap?

Research Question 3: Do the individual PsyCap factors (hope, efficacy, resilience and optimism) differentially explain variance in outcomes variables and thereby offer insight into the mechanisms of effect of PsyCap?

Examination of the utility of a four-factor model of PsyCap in comparison to the conventional second-order model may provide for improvements in the criterion validity of the construct. Furthermore, by considering the individual factors of PsyCap separately (using a four-factor model), it may be possible to determine which PsyCap factors are most important in relation to particular outcome variables. This insight may allow organizations and managers to identify the individual PsyCap capacities which are most relevant to their workplace based on those outcomes most pertinent to the organization's functioning. Consequently, more tailored interventions aimed at enhancing those particular PsyCap capacities could be developed and implemented. By developing a greater understanding of the mechanisms of effect of PsyCap, it may also become possible to identify potential organizational factors (e.g. performance appraisal procedures; Rego et al., 2010) which boost (or inhibit) aspects of employee PsyCap and thus, employee functioning.

Research Question 4: What are the current theoretical frameworks to support the extension of PsyCap to the team-level and are there areas for further development in relation to the conceptualization, operationalization and measurement of PsyCap at the team-level?

The theoretical analysis of collective PsyCap presented in Chapter 5 will provide a research agenda aimed towards improving the alignment between theory, conceptualization and operationalization of PsyCap at higher-levels of analysis. Moreover, this research will extend PsyCap scholarship by identifying unique antecedents and emergence processes relating to collective PsyCap; thereby commencing the development of a conceptual nomological network of collective PsyCap.

These theoretical developments hold important implications for practice. Validation of the proposed nomological network of collective PsyCap will enhance the utility of PsyCap at higher-levels of analysis, particularly in relation to team selection and composition and team development. This could subsequently help to inform organizational practices in regards to developing and maximizing the potential of their work teams.

Research Question 5: How does team-level PsyCap relate to outcomes at both the team-level (e.g. team performance, satisfaction and conflict) and the individual-level (job satisfaction and turnover intentions)?

This thesis will provide the first examination of the potential cross-level effects of team-level PsyCap on employee functioning. Thus, the study presented in Chapter 6 will extend current collective PsyCap scholarship by investigating how team-level PsyCap relates to outcomes at the individual-level (e.g. job satisfaction and turnover intentions), as well as at the team-level (e.g. team performance,

satisfaction and conflict). It is anticipated that membership of a positively-oriented team will not only enhance aspects of team performance and functioning, but also individual employee functioning. As such, findings from this research could inform management practices in regards to staff development, by emphasizing the importance and benefits of fostering team-level positivity in organizations.

Research Question 6: Which compositional model of team-level PsyCap (e.g. direct-consensus composition or referent-shift composition) is most viable in terms of predicting outcomes at the individual- and team-level?

Investigation of the two dominant composition models of collective PsyCap (direct-consensus composition and referent-shift composition) will provide greater clarity regarding the operationalization and measurement of the construct at the team-level. Thus, the findings from the study presented in Chapter 6 will offer important insights for collective PsyCap scholarship, as previous studies have been divergent in the operational approach used to aggregate PsyCap to the team-level. Findings from this study will also hold implications for practice as they will inform more accurate measurement of team-level PsyCap, thus allowing for greater understanding of positivity within work teams and other collectives.

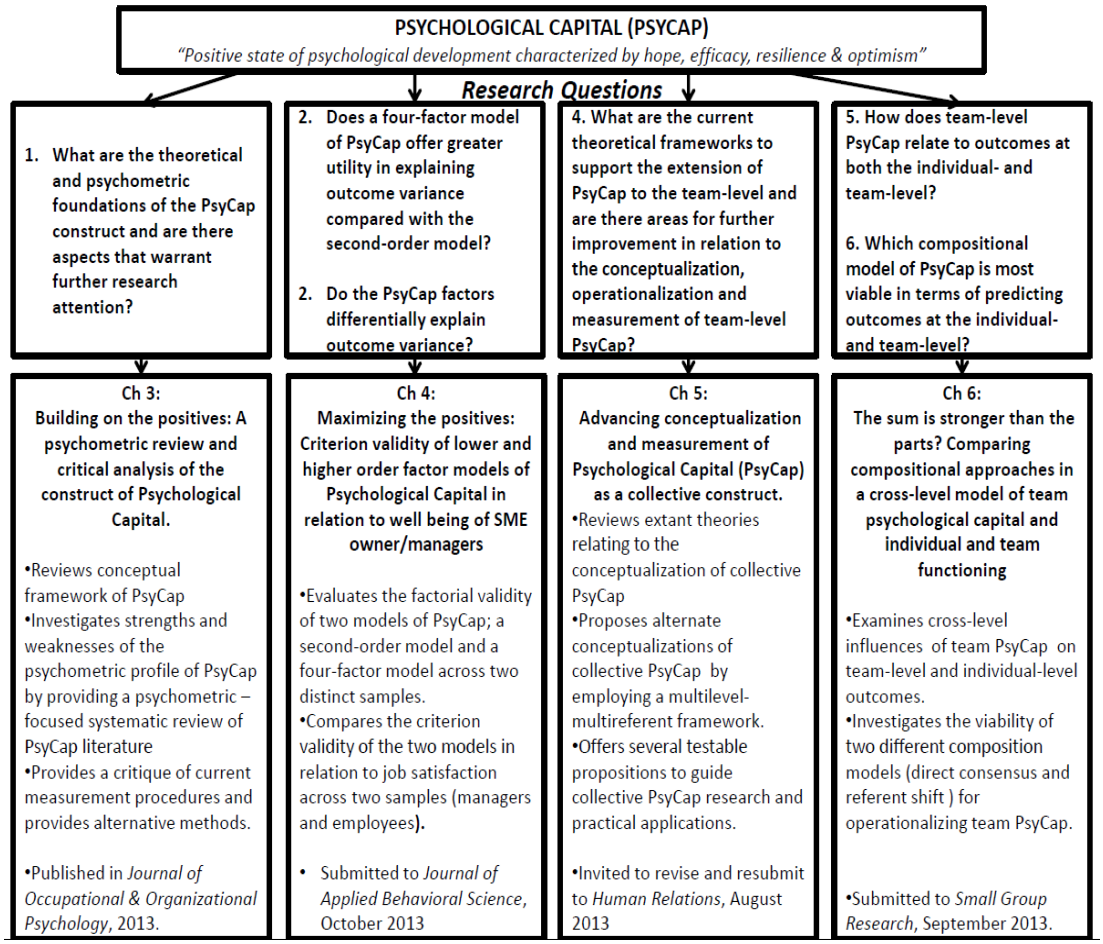

Figure 1-5. The specific research questions of this thesis and the related chapters and research articles.

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Chapter 2: Methods

2.1 Preface

The program of research contained within this thesis ascribes to a foundationalistic ontological framework as it is primarily concerned with observations, collection of evidence and measurement in order to depict patterns and relationships (Moses & Knutsen, 2007). Thus, consistent with the dominant approach to research conducted within the organizational behavior paradigm (Buchanan, & Bryman, 2007) and more specifically, the positive organizational behavior paradigm (see Avey, Reichard, Luthans & Mharte, 2011); this research adopts a positivistic epistemological approach. Accordingly, and as reflected in the research questions developed in Chapter 1, the research contained in this thesis uses theory to generate hypotheses and propositions, some of which are subsequently tested; with the overall aim of building evidence toward the establishment of causal relationships between social phenomenon (Cunliffe, 2010).

This chapter outlines the particular research designs and methodologies of the studies in this thesis. The first section of this chapter focuses on the conceptual and literature-based research approaches employed in Chapter 3 (a psychometric-focused systematic review) and Chapter 5 (theoretical analysis and development). The second part of this chapter is concerned with survey-based research methodologies which have been used in Chapters 4 and 6. A rationale for the use of survey-based methodologies is provided, along with discussion of the general limitations associated with this type of research. This will be followed with an overview of the specific data analysis approaches used in each of the empirical studies and consideration of important issues pertaining to the use of these approaches. The

chapter will conclude with a summary of the two independent samples used in Chapters 4 and 6.

2.2 Literature-Based Methodologies

2.2.1 Systematic Review

A systematic review was employed in Chapter 3 in order to provide a critical and synthesized analysis of the PsyCap construct, specifically in relation to its theoretical conceptualization and its psychometric properties as reported in the literature to date. As the first independent review of PsyCap, it complements but also builds on the three previous PsyCap reviews which have focused primarily on the criterion validity of PsyCap (Avey et al., 2011) and its future applications (Youssef & Luthans, 2011; 2012).

Currently, systematic reviews are considered the 'gold standard' for synthesizing quantitative empirical studies (Higgins & Green, 2011) as they establish whether findings are consistent and can be generalized across populations and settings (Mulrow, 1994). By implementing explicit and systematic procedures, the objective is to appraise and summarize all of the available evidence pertaining to a specific question (or series of questions) and then attempt to reconcile and interpret it so as to provide answers to these questions (White & Schmidt, 2005). Consequently, systematic reviews, along with other integrative methods (i.e. meta-analyses) are used by researchers to keep abreast of the primary literature in a given field.

Systematic review methodology generally comprises eight steps: 1) formation of a review question/s; 2) defining inclusion and exclusion criteria; 3) locating studies; 4) selecting studies; 5) assessing study quality; 6) extracting data; 7) analyzing and presenting studies; and 8) interpreting the results (Turner & Nye, 2007). The systematic review was designed in an attempt to reduce the influence of

the reviewer's own bias. For instance, the use of specific search and selection criterion decreases the likelihood of findings being biased and also enables reproducibility (White & Schmidt, 2005). In addition, a systematic review is able to frame all elements of a research question, including data on a pre-specified set of outcomes.

Although well-conducted systematic reviews can provide an efficient synopsis of relevant findings from research in a given area, this methodology is not without limitations. The findings reported within a systematic review are only as reliable as the methods used to synthesize the reviewed research. As such, this approach does not correct for publication biases, whereby studies that report significant, positive findings are more likely to be published quickly and cited by others (Higgins & Green, 2011). Consequently, systematic reviews can be biased towards a positive result due to over-representation of studies reporting significant and positive findings. Guidelines for conducting and reporting systematic reviews suggest that this bias be minimized by employing extensive and methodical literature search strategies (Higgins & Green, 2011).

Additionally, despite its name, a systematic review does not guarantee that a review has been conducted and reported with due methodological rigor. To reduce the likelihood of arriving at misleading or inaccurate conclusions, adherence to review methodological procedures, such as those outlined above, should be maintained (Higgins & Green, 2011). Moreover, review procedures should be clearly reported so as to enable readers to establish the quality of the review and its potential limitations. These specific procedures are detailed in the study reported in Chapter 3.

2.2.2 Theoretical Analysis and Development

Chapter 5 undertook a theoretical analysis of collective PsyCap research; specifically it examined theories relating to the *extant* conceptualization and definition of collective PsyCap, including collective efficacy theory and contagion principles. Although PsyCap has traditionally been conceived as an individual-level construct, more recently research has begun to examine PsyCap as a collective phenomenon. However, to date and as highlighted in Chapter 1, a detailed examination of explicit theoretical frameworks to support the conceptualization and operationalization of collective PsyCap is yet to appear in the literature.

Theoretical analyses (also known as narrative reviews) serve a vital function in research, by providing a bridge between articles focused on a particular area of study and presenting conclusions of scope and theoretical level that a typical empirical report cannot provide (Rumrill & Fitzgerald, 2001). As such, this type of analyses can provide two main contributions to the literature in a particular area. First, a theoretical analysis can provide an evaluation of a theory by reviewing the literature relevant to the validity of an existing theory and drawing conclusions regarding the merits of existing conceptualizations (Baumeister & Leary, 1997). Second, a theoretical analysis can aim to develop theory by proposing a new conceptualization or theory of a particular phenomenon (Baumeister & Leary, 1997). In this case, the theoretical analysis reviews relevant literature to provide a framework for describing, elaborating and evaluating the new theory. Alternatively, the new theory may extend from the integration of the reviewed literature contained within a theoretical analysis.

Although this methodology has not previously been used within PsyCap research, this approach has been applied broadly in the development of new theories

across organizational behavior research. In particular, theoretical analyses have been employed to extend theoretical frameworks to collective levels (e.g. group emotional intelligence, Côté, 2007; justice climate, Li & Cropanzano, 2009; team efficacy, Mischel & Northcraft, 1997).

Despite the utility of theoretical analyses in terms of evaluating and extending theory, there are limitations associated with this methodology. Most commonly, theoretical analyses are criticized because the determination of which commentaries and studies to include, how they are evaluated and the subsequent conclusions drawn from them are all highly subjective processes. As such, theoretical analyses are subject to potentially misleading conclusions (Cooper & Dorr, 1995). In particular, misleading conclusions can arise from a number of sources including publication bias, selection bias, subjective weighing of the studies chosen for the review, unspecified inclusion criteria and failure to consider the relationships between study characteristics and study results (Cooper & Rosenthal, 1980). These limitations can be minimized when there are relatively fewer studies to be reviewed and a clear, systematic procedure is established prior to collecting, reviewing and analyzing studies (Rumrill & Fitzgerald, 2001). Hence, an emergent research area such as collective PsyCap may be particularly suitable for such an approach.

2.3 Survey-Based Methodologies

The preceding section has provided an overview of the conceptual and literature-based methodologies employed in Chapters 3 and 5. Attention will now be given to the methodologies used in the two empirical studies presented in Chapters 4 and 6. Although some consideration for methodological shortcomings is given in each of the substantive chapters, these discussions are somewhat brief given that the chapters comprise manuscripts that have also been prepared for submission for

publication. Thus, the following is an integrated overview of the methodological limitations and relevant literature regarding the best practice management of these limitations. First, a rationale for the use of a survey-based methodology in both empirical studies, along with discussion of the associated limitations is provided. This is followed by an overview of the specific data analysis approaches used in each of the studies, specifically confirmatory factor analysis and structural equation modeling (Chapter 4) and hierarchical linear modeling (Chapter 6), and a discussion of important issues pertaining to the use of these approaches.

2.3.1 Survey-Based Research Methodology

The empirical studies in Chapters 4 and 6 used self-report, survey-based data to test models of PsyCap at both the individual- and team-levels of analysis (see Appendices for copies of the surveys for each study). In both studies, previously established and validated scales were employed to measure the constructs of interest (see Table 2-1). Specific details pertaining to the psychometrics of each of the scales are reported in the respective chapters.

As the studies were primarily concerned with assessing individuals' psychological perceptions (i.e. PsyCap) and other self-referential constructs (i.e. job satisfaction, turnover intent and job tension) a self-report, survey-based methodology was deemed appropriate. This is reflected in current PsyCap research, which has exclusively relied on versions of the self-report, survey-based measure of PsyCap, the PsyCap Questionnaire (PCQ, Luthans, Youssef & Avolio, 2007).

Table 2-1

A Summary of the Scales Used in the Two Empirical Studies Presented in Chapters 4 and 6

Variable	Scale Reference	Number of Items	Chapter
PsyCap	PCQ; Luthans, Youssef & Avolio (2007)	24	4 & 6^
Job Satisfaction	Warr, Cook & Wall (1979)	3	4 & 6
Job Tension	House & Rizzo (1972)	7	4
Turnover Intentions	Fried & Tiegs (1995); Meyer, Allen & Smith (1993)	4	6
Team Performance & Satisfaction	Hirst (1999)	11	6
Team Conflict	Jehn (1995)	8	6

Note. ^ A team-referent version of the PCQ was also implemented in Chapter 6.

Self-report survey-based research offers several advantages. For instance a structured self-report survey allows the confidential collection of perceptual data from a targeted population. In comparison with other methods, such as face-to-face or telephone interviews, this approach is more efficient and parsimonious, thereby enabling access to a greater number of potential participants (Neuman, 2003). Self-report, survey-based research also eliminates the risk of interviewer bias and maintains participants' anonymity (Sarantakos, 2005).

However, self-report, survey-based research designs also invite the potential for common method variance to affect the validity of the results. This, along with other limitations associated with the research designs for the empirical studies included in this thesis will now be discussed, along with consideration for how to best mange these limitations.

Self-Report Data and Cross-Sectional Design:

As outlined above, the measures used in the empirical studies are self-report scales collected from a single source; making the results vulnerable to bias. Most notably, the use of a single source method to measure predictor and criterion variables increases the risk for common method variance (CMV). Although there is debate regarding the bearing CMV has on findings, with some arguing that the problem is over-stated (e.g. Lindell & Whitney, 2001; Spector, 1987, 2006; Vanderberg, 2006), it is generally accepted that correlations between variables measured using the same method and/or source may be somewhat inflated, which therefore creates biases in empirical conclusions (Lance, Dawson, Birkelbach & Hoffman, 2010).

Several "procedural remedies" have been suggested to minimize the risk for CMV, including the use of multiple sources to measure predictor and criterion variables (Podsakoff, Mackenzie, Lee & Podsakoff, 2003, p. 887). In organizational research, this typically includes using measures from key informants (e.g. supervisors, co-workers) or employing 'hard' data from archival sources (e.g. using company records to assess employee absenteeism). Implementing multiple sources for data collection arguably make it less likely for observed relationships between variables to be biased because the effects of social desirability, consistency motifs and respondent mood states are either reduced or eliminated altogether (Podsakoff et al., 2003). This approach is particularly useful in relation to the measurement of job performance, as self-report measures of performance are considered particularly problematic given that individuals are likely to hold favorable views of their own performance (Van der Heijden & Nijhof, 2004).

However, obtaining measures from different sources is not always advisable, particularly in relation to the measurement of psychological constructs (e.g. PsyCap) and other self-referential constructs, such as job satisfaction. In fact, in these cases the use of non self-report measures is problematic and usually less valid than self-report measures (Brannick, Chan, Conway, Charles & Spector, 2010). This is primarily because individuals' perceptions do not necessarily translate to behaviors which can be accurately observed by others. Thus, implementing alternative sources for data collection in Chapter 4 was not feasible, given that all the variables (PsyCap, job satisfaction and job tension) were self-referential in nature.

Although the studies in Chapters 4 and 6 are susceptible to CMV because data was collected using self-report, single source methods, it is worth noting other aspects of the research design which may have reduced other sources of CMV. For instance, surveys were completed anonymously and online, making responses less vulnerable to social desirability, acquiescence, and leniency (Podsakoff et al., 2003). Additionally, the measures employed in the studies used different scale end points, as well as labels for scale mid points, which further reduce the likelihood for acquiescence bias.

A further limitation of the empirical studies reported in this thesis is that both are cross-sectional in nature, thereby precluding casual inferences in the findings. As such, cross-sectional designs are typically criticized and discouraged, particularly for publication purposes (Kozlowski, 2009). However, Kulik (2011) suggests that there is some value in cross-sectional research and that multilevel, multisource, longitudinal research should not be assumed as the only way to produce "quality research outcomes" (p. 453). In particular it is arguably suitable for establishing an initial empirical base for an emergent research area such as PsyCap.

Convenience Sampling:

A further area of potential weakness pertaining to the empirical studies described in Chapters 4 and 6 relate to the use of convenience sampling. Although there are known disadvantages of using convenience samples, such as the inability to make generalizations from the sample to the general population, their use is also relatively cost and time efficient in comparison to probability sampling techniques. Consequently this method has been commonly employed in PsyCap research (i.e. Avey, Hughes, Norman & Luthans, 2008; Jensen & Luthans, 2006; Roberts, Scherer & Bowyer, 2011). Specific sampling and data collection procedures are described in Chapters 4 and 6.

2.3.2 Confirmatory Factor Analysis and Structural Equation Modeling

Chapter 4 investigated the added utility of a four-factor model of PsyCap compared with a conventional second-order model in the prediction of work attitudes at the individual-level. Thus, Chapter 4 employed confirmatory factor analysis (CFA) and structural equation modeling (SEM) analyses.

CFA and SEM are the most commonly used procedures in the development and evaluation of psychological measures and are particularly useful with multi-item measures designed to assess multifaceted constructs (Floyd & Widaman, 1995), such as PsyCap. However, despite their importance and popularity, these analyses are frequently misunderstood and misused as statistical techniques (Matsunaga, 2010). Thus, the following is a brief overview of some major issues important in the application of both CFA and SEM, including model specification, model fit and sample size.

Model Specification:

Unlike exploratory factor analysis, which is intended to generate new theory by exploring latent factors that best account for the underlying relationships between variables (Henson & Roberts, 2006), CFA is used to test existing theory. Thus, a priori theory regarding the factor structure underlying the data is needed. As such, researchers are required to specify the number of parameters to be estimated in the model (Matsunaga, 2010) before assessing whether the model fits the data adequately.

As outlined in Chapter 1, a second-order model of PsyCap has been supported by way of acceptable model fit indices (e.g. Avey, Luthans & Youssef, 2010; Luthans, Avey, Avolio & Peterson, 2010; Luthans, Avolio, Avey & Norman, 2007). However, other research has suggested a four-factor model of PsyCap in which the constructs of hope, self-efficacy, resilience and optimism are considered individually (Gooty, Gavin, Johnson, Frazier & Snow, 2009; Rego, Sousa, Marques & Cunha, 2012). Additionally, it has been reported that a four-factor model of PsyCap demonstrated superior construct and criterion validity in relation to job performance compared with a second-order model (Rego, Marques, Leal, Sousa & Cunha, 2010).

Following on from these findings, Chapter 4 investigated differences between two models of PsyCap (a four-factor model and a second-order model) in explaining variance in levels of job satisfaction and job tension (see Figures 2-1a & b). Additionally, the chapter examined whether particular individual PsyCap factors are differentially important in the prediction of these outcomes.

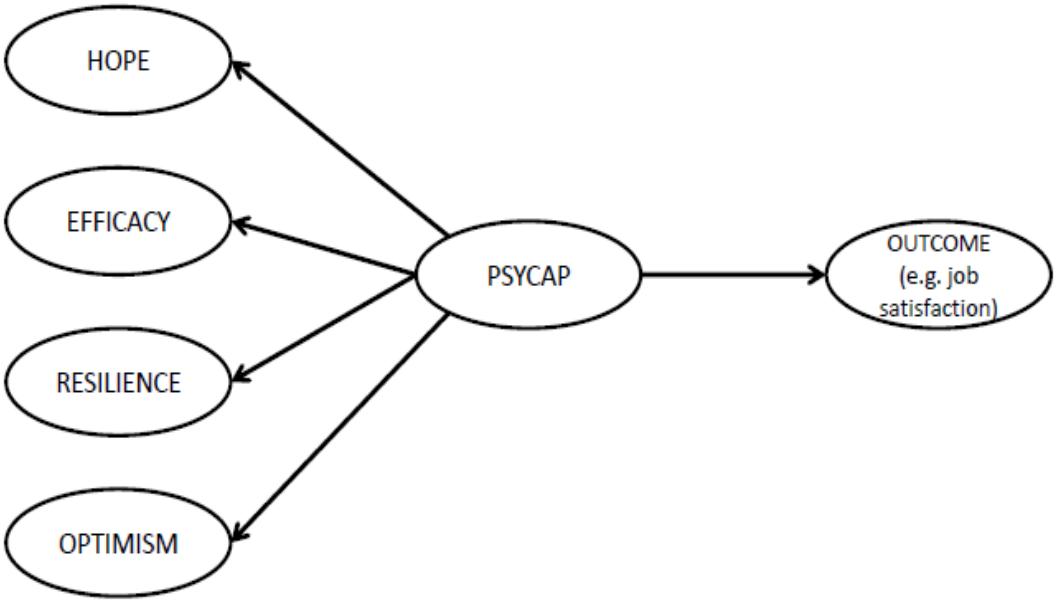

Figure 2-1a. Model specification of a second-order model of PsyCap in the prediction of job related outcomes.

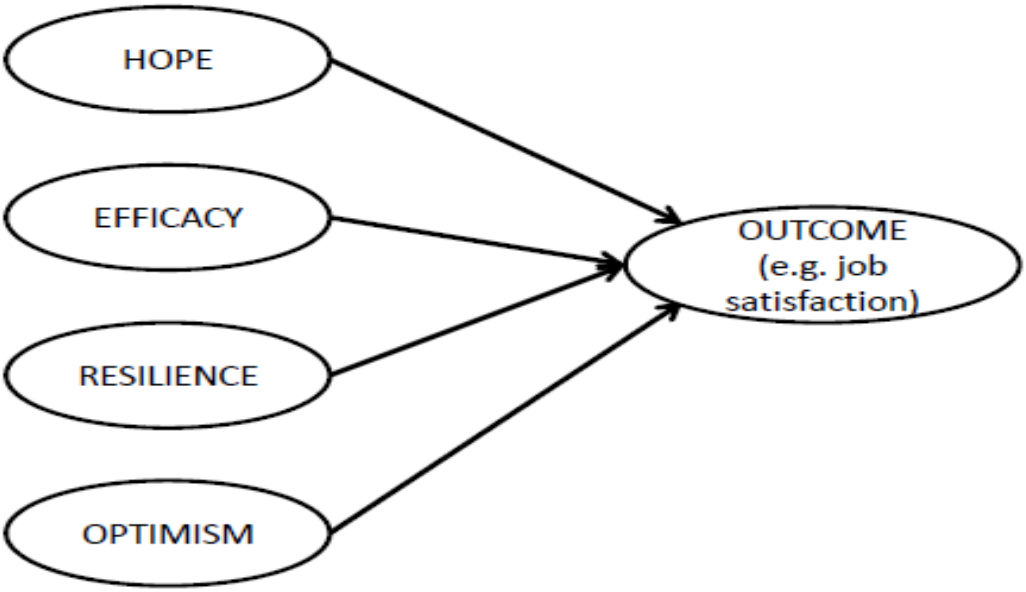

Figure 2-1b. Model specification of a four-factor model of PsyCap in the prediction of job-related outcomes.

Model Fit:

Model fit can be evaluated with a variety of model fit indices, however the issue of which indices to report (and which cut-off values to use) is by no means agreed (Hooper, Coughlan & Mullen, 2008). A general rule of thumb is to report a variety of indices as they each reflect different aspects of model fit (Crowley & Fan, 1997).

The chi-square statistic indicates the degree of discrepancy between the data's variance/covariance pattern and that of the model being tested (Matsunaga, 2010). Although the chi-square is easy to interpret (e.g. if χ^2 is statistically significant, the model is considered discrepant from the true covariance structure), the test is strongly influenced by sample size. Larger sample sizes and greater model complexity are more likely to result in a significant chi-square (Russell, 2002). Subsequently, a trivial difference between the model and data may be detected, resulting in the proposed model being rejected (Tabachnick & Fidell, 2007).

To remedy this, it is suggested that researchers examine at least two other indices of model fit in addition to the chi-square test (Hu & Bentler, 1999). There are several 'clusters' of fit indices available to assess model fit. The first of these is the *approximate fit index* which is typically represented by the root mean square error of approximation (RMSEA; Steiger, 1990). RMSEA assesses "the amount of error approximation per model degree of freedom and takes sample size into account" (Kline, 2005; p. 139). Thus, unlike the exact fit index (e.g. χ^2), this index provides an assessment of how closely the model fits the data. Recommended cut off values for RMSEA vary from .06 (Hu & Bentler, 1999) to .08 (Marsh, Hau & Wen, 2004).

The second cluster is the *incremental fit index*. These indices examine the degree to which the tested model accounts for variance in the data compared with a

baseline model (Matsunaga, 2010). It includes the Tucker-Lewis index (TLI, Tucker & Lewis, 1973) and the comparative fit index (CFI; Bentler, 1990). The CFI is one of the most commonly reported fit indices as it is least effected by sample size (Tabachnick & Fidell, 2007). Hu and Bentler (1999) recommend an incremental fit index above .95 to reflect adequate model fit, although a value of .90 is generally accepted in the literature (Russell, 2002).

The third cluster is *residual based index.* These indices assess differences between observed covariances and the covariances predicted by the model being tested (Matsunaga, 2010). The conventional residual based index is the standardized root mean square residual (SRMR). Values for the SRMR range from 0 to 1.0. Well-fitting models are represented by SRMR values less than .05 (Diamantopoulos & Siguaw, 2000), although values up to .08 are deemed acceptable (Hu & Bentler, 1999).

Following recommendations to employ a variety of fit indices (e.g. Crowley & Fan, 1997; Kline, 2005), the study in Chapter 4 assessed goodness of fit using the χ^2-test and the RMSEA, CFI, TLI, and SRMR indices. Additionally, the study adopted Hu and Bentler's (1999) combinatorial rule that two of three indices should meet cut-off recommendations outlined above to represent adequate model fit.

Sample Size:

Explicit guidelines regarding appropriate minimum samples sizes for factor analysis vary. For instance, traditional assumptions recommended a 4:1 or 5:1 participant to variable ratio (Gorsuch, 1983). Other recommendations outline that five participants per variable is sufficient, providing a minimum sample size of 100, or 10 participants per variable in samples of less than 100 (Streiner, 1994).

More recently, researchers have questioned across-the board, participant-to-variable ratios, citing a lack of sound theoretical or empirical evidence to support such rules. Rather, adequate sample size for a study is dependent on a variety of factors including model size, distribution of variables, missing data, reliability of variables, the strength of relationships between variables and desired statistical power (Muthén &Muthén, 2002). Although techniques such as Monte Carlo simulation studies (e.g. Guadagnoli & Velicer, 1988; Muthén &Muthén, 2002) provide a substantive method for determining sample size and statistical power for CFA and SEM; less laborious sample size calculation methods are also available (e.g. Soper, 2013; Westland, 2010). These methods compute minimum required sample size based on the number of manifest and latent variables, anticipated effect size (i.e. correlation between latent variables), desired probability and statistical power levels. Sample size calculations were implemented for the study presented in Chapter 4 and will be discussed in the proceeding section detailing the sample used in this study.

2.3.3 Multilevel Modeling

The study in Chapter 6 aimed to extend collective PsyCap research and theory by implementing a multilevel approach that compared the relationships different conceptualizations and operationalizations of team PsyCap have with outcome variables at the individual- and team-level of analysis (see Figure 2-2).

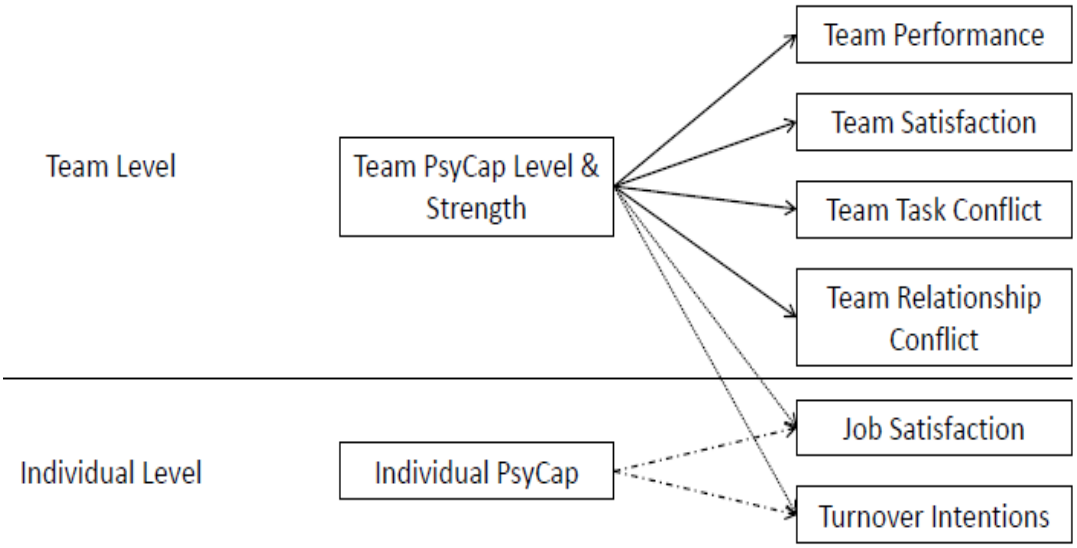

Figure 2-2. Multilevel model of PsyCap investigated in Chapter 6.

Composition Models of Aggregation

In order to guide the operationalization of the team PsyCap construct and the functional relationship between individual-level and team-level PsyCap, Chan's (1998) typology of composition models was implemented. This typology has been influential in guiding multilevel research in regards to selection of aggregation methods (Li & Cropanzano, 2009). A detailed discussion of Chan's (1998) typology of composition models is provided in Chapter 5. However, a brief overview of the three composition models (direct-consensus, referent-shift and dispersion models) central to the study in Chapter 6 is provided here so as to position important considerations regarding subsequent data analysis.

Direct consensus modeling represents the most commonly used method of composition among multilevel researchers (Chan, 1998, p. 237). This model implements within-group consensus of the lower-level units as the functional relationship to specify how the construct at the lower-level is functionally isomorphic to another form of the construct at the higher-level. Typically, a within-group

agreement index (e.g. r_{wg}; James, Demaree & Wolf, 1984) of the scores from the lower-level with a certain cut-off value (i.e. .70) is employed to represent within-group consensus and therefore justify aggregation of the construct to the higher-level. Conversely, when consensus within the unit does not reach the pre-determined cut-off value, it is assumed that there is insufficient agreement within the unit to warrant aggregation to the higher-level (Klein, Conn, Smith & Sorra, 2001).

Reliability measures such as interclass correlations (ICCs) are also commonly employed to assess the appropriateness of aggregating individual scores to the higher-level (Bliese, 2000). The ICC_1 indicates the level of agreement among ratings from members in the same group. On the other hand, the ICC_2 determines whether groups can be differentiated on the variables under investigation (LeBrenton & Senter, 2008).

The *referent-shift model* shares some procedural similarities with the direct-consensus approach, in so far as justification for aggregation to the higher-level is dependent upon sufficient within-group consensus (i.e. r_{wg}; James et al., 1984) and appropriate ICC values. However, unlike direct-consensus, where the referent of interest is the individual's experience or perceptions (i.e. *"I feel confident…"*), the referent-shift model focuses on the individual's perception of the unit as a whole (i.e. *"My team feels confident..."*). This new referent is then combined to represent the higher-level construct providing sufficient within group agreement (Rupp, Bashshur & Liao, 2007).

Dispersion modeling is vastly distinct to other composition models, in that it postulates that the degree to which team members share (or do not share) the same opinion is more than a statistical requirement for aggregation and that dispersion of scores is a construct in its own right (Li & Cropanzano, 2009). Thus, providing there

is adequate composition theory, the degree of agreement or disagreement within the team on a particular measure can become the focal construct and within group variance is no longer treated as error variance, but rather as the operationalization of the focal construct.

Hierarchical Linear Modeling

In order to investigate the relationships between team-level PsyCap and individual- and team-level outcomes the study in Chapter 6 employed a hierarchical linear modeling data analysis approach (using HLM software; Raudenbush, Bryk, Cheong & Congdon, 2004). Hierarchical linear modeling enables investigation of how variables at a higher level (e.g. team-level PsyCap) influence variables at a lower level (e.g. individual-level employee job satisfaction. Specifically, hierarchical linear models recognize that individuals nested within a group may be more similar to one another than to individuals nested in other groups; thus their observations may not be independent. To account for this, hierarchical linear models model both group-level and individual-level residuals to represent the partial independence of individuals nested in the same group (Marrone, Tesluk & Carson, 2007; Raudenbush & Bryk, 2002).

Hierarchical linear models also allow simultaneous investigation of higher-level and lower-level variance in the outcome variable, while maintaining the appropriate level of analysis for the independent variable (Kozlowski & Klein, 2000). Thus, this approach permits the modeling of both individual- and group-level variance in outcomes by implementing individual predictors (i.e. individual-level PsyCap) at the individual-level and group predictors (i.e. team-level PsyCap) at the group-level. Consequently, this approach does not force the researcher to discard potentially meaningful within group variance.

Sample Size:

An important consideration for multilevel modeling is determining what constitutes sufficient sample size for accurate analyses. Multilevel analyses commonly employ asymptomatic maximum likelihood estimation methods which operate on the assumption of a large sample size (Maas & Hox 2004). This is especially important at the higher level (e.g. group/team-level), because the group-level sample size is always smaller than the individual-level sample size.

Simulation research has examined what group-level sample size can be considered adequate. Although, estimates of sample size differ to some extent depending on to the simulation conditions, it has been reported that few groups (i.e. less than 50 groups/teams or level-2 units) can lead to biased estimates in the second-level standards errors (Maas & Hox, 2004, 2005). Consequently, a rule of thumb for multilevel sample size suggests that if researchers are only concerned with investigating fixed effects, a sample size of 10 groups can provide adequate estimates; if researchers are also interested in examining contextual effects, a minimum sample size of 30 groups is needed; and if researchers also want to be able to correct estimates of standard error, samples need to exceed 50 groups (Maas & Hox, 2004, p. 135). This rule of thumb was implemented in Chapter 6 and will be reflected in the following section detailing the sample used in this study

Team-Level Responses Rates & Missing Data:

Obtaining complete data in team-level field research is rare and often near impossible (Roth & BeVier, 1998). Consequently studies usually report team-level survey measures with missing data. Missing data (also referred to as *non-response*) is an important issue in team-level research as it can reduce external validity and statistical power (Newman, 2009). Relevant to research using compositional

measurement models (e.g. individual-level data is aggregated to measure team-level constructs; Kozlowski & Klein, 2000), within team non-response also creates biases in estimates of within group agreement and reliability, and impacts hypothesis testing by restricting the distribution of team-level responses (Maloney, Johnson & Zellmer-Bruhn, 2010).

Within team non-response also has implications for sample size and statistical power. For instance, attempts to improve compositional measurement reliability by employing conservative within-team response cut-off rates (e.g. eliminating teams when less than half of the team members have responded) are likely to result in small sample sizes; thereby compromising the statistical power of the study. Conversely, implementing liberal within-team response rate cut-offs can reduce the credibility of the research, as low response rates may not be representative of the overall team.

Reviews of team-level research reveal little consensus regarding acceptable non-response cut-offs and the management of non-response data (e.g. Allen, Williams, Stanley & Ross, 2007; Maloney et al., 2010). Moreover, there appears to be a general lack of transparency in the reporting of within team non-response. For example, a review of group-level studies (N = 62) published in top tier management journals between 2000 and 2009 showed that the majority of studies (N = 47) neglected to provide any information about within team response rates (Maloney et al., 2010). In relation to the management of non-response, the most common approach was to eliminate teams from analysis when only a certain number or percentage of team members responded. However, again there was little agreement across studies regarding acceptable levels of within team non-response (Maloney et al., 2010).

Monte Carlo simulation analyses have been used to demonstrate the effects various cut-off rules have on measurement accuracy, sample size and finding significance. Interestingly, these analyses reveal that stringent cut-off rules (and thereby excluding a greater number of teams from the analysis) have detrimental implications for "substantive conclusions" (Maloney et al., 2010, p. 295). Thus, the negative effects of lower measurement reliability by including data from teams with low response rates (i.e. even including teams even if only one member responds) are outweighed by the positive effects of a larger sample size.

Given that researchers need to make these types of trade-off decisions (e.g. measurement reliability versus statistical power) depending on the focus of their research, blanket cut-off rules for 'acceptable' team non-response rates are unfeasible. However, regardless of the cut-off decisions implemented, Maloney et al. (2010) advised that it is critical that researchers are explicit in their reporting of within team response rates and management of missing data. Accordingly, details pertaining to team response rates and the management of missing data are outlined below in relation to the sample description for the HLM study (Chapter 6).

2.4 Study Samples

The empirical studies presented in this thesis have employed two independent samples. In Chapter 4 the factorial and criterion validity of PsyCap at the individual-level was investigated utilizing a sample of owner/managers from the small-to-medium enterprise (SME) sector. In Chapter 6, analyses focused on PsyCap at the team-level and used a sample of employees working with teams from a cross-section of industries.

2.4.1 SME Owner/Manager Sample

This sample was derived from baseline data collected in the *Business in Mind* project (a longitudinal intervention study; Martin, Sanderson, Scott & Brough, 2009). The *Business in Mind* program is a mental health promotion intervention targeting small-to-medium enterprise owner/managers. A sample of 193 SME owner/managers was obtained (see Figure 2-3). Using methods described earlier in this chapter regarding sample size for CFA/SEM (Soper, 2013; Westland, 2010), power analysis calculations that assume small to medium effect sizes (i.e. correlations between latent variables) demonstrate that this sample meets recommended minimum sample size for the CFA and SEM analyses in this study. However, it is acknowledged that in relation to sample size more is almost always better and that the sample size used in this most likely represents the bare minimum requirements for meaningful inferences.

Further information pertaining to the recruitment and demographics of this sample is provided in Chapter 4.

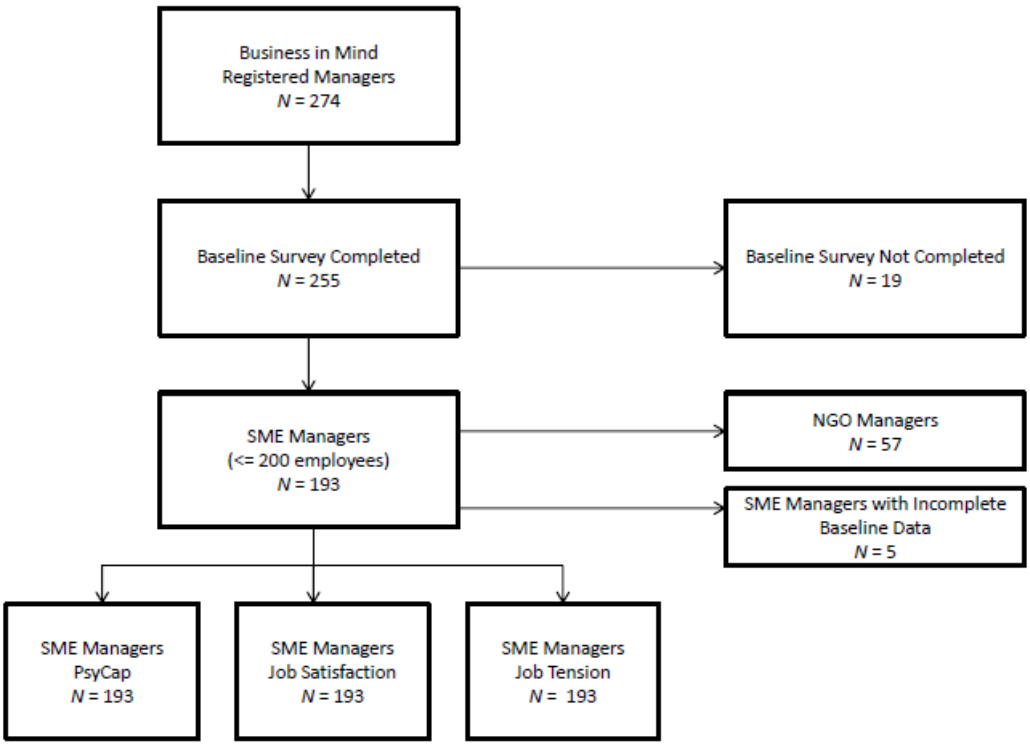

Figure 2-3. Study sample derived from baseline phase of *Business in Mind.*

2.4.2 Employee Team Sample

This sample consisted of employees (comprising 43 work teams) from a cross-section of organizations including government and non-government organizations, private sector companies and smaller private enterprises; representing energy and resources, employment and recruitment, financial services, counseling, and child care.

Although the number of teams involved in this study is small, the sample size meets the general accepted minimum criteria of 30 level-two unit observations for modeling multilevel effects (Maas & Hox, 2004). Moreover, it has also been suggested that as the HLM modeling strategy is somewhat complex "simpler is sometimes better" (James & Williams, 2000, p. 423).

Following recommendations outlined previously (Maloney et al., 2010) data was included in the analyses providing at least two members from a team had responded. Consequently, data from eight teams was excluded from the analysis as only one team member had provided data. This resulted in an overall response rate of 50.3% and an average team size of 4.5 members. Table 2-2 details the number of teams recruited from each organization, team sizes and response numbers per team used in the analysis. Further information regarding the recruitment and demographics of this sample is provided in Chapter 6.

Table 2-2

Participation numbers for each team recruited from each of the 10 organizations

Organization	Team	Team Size	Respondents/Team
1	1	5	3
2	2	12	4
	3	13	4
	4	12	4
	5	14	14
	6	15	4
	7	13	3
	8	10	4
	9	6	3
	10	6	5
	11	11	3
3	12	5	2
	13	4	3
4	14	7	2
5	15	4	4
	16	25	17
6	17	9	6
	18	8	6
	19	20	5
	20	8	3
	21	17	3
	22	5	2
	23	6	2
	24	7	5
	25	7	3
7	26	4	2
	27	5	3
	28	5	5
8	29	7	6
	30	10	4
	31	12	6
	32	5	2
	33	4	3
	34	3	2
9	35	10	8
	36	14	5
	37	15	8
	38	13	2
	39	3	2
	40	3	3
10	41	6	6
	42	9	7
	43	7	5

2.5 Ethics

Informed consent was obtained from *Business in Mind* owner/manager participants (Chapter 4) and the team PsyCap study employee participants (Chapters 6). The study protocols for both studies were approved by the Human Research Ethics Committee (TAS), which is a joint agreement between the University of Tasmania and the Department of Health and Human Services (DHHS) (Ref No: H0010439). Ethics approval was not required for the studies described in Chapters 3 or 5 as these studies are conceptual in nature and did not involve the direct collection of data from human participants.

2.6 Post Script

This chapter detailed information pertaining to the primary research approaches used in the subsequent chapters and discussed important issues relevant to the application of these methodologies that were beyond scope for the individual papers that make up Chapters 3 to 6 of the thesis. In the next chapter, the first substantive chapter of the thesis, a systematic review of extant PsyCap literature is presented. The review provides a critical assessment of the theoretical underpinnings and psychometric profile of the PsyCap construct. A series of directives for advancing PsyCap research are provided, some of which help to form the basis for subsequent chapters of this thesis.

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Chapter 3: Building on the positives: A psychometric review and critical analysis of the construct of Psychological Capital

3.1 Preface

The construct of Psychological Capital (PsyCap) focuses on the synergistic positive psychological capacities of self-efficacy, hope, optimism and resilience and their relationship with a range of desirable work attitudes, behaviors and organizational outcomes. There is now almost a decade of accumulated PsyCap research. However, a critical and synthesized analysis of the construct, in terms of its theoretical conceptualization and psychometric properties is yet to appear in the literature. Consequently, this chapter aimed to provide a comprehensive review and analysis of the PsyCap literature, focusing in particular on issues relevant to the psychometric profile of PsyCap as it is currently assessed. Six directives for advancing PsyCap research are proposed as part of an integrated research agenda aimed towards strengthening the conceptualization and measurement of PsyCap.

The material presented in this chapter has been published in the peer-reviewed *Journal of Occupational and Organizational Psychology*.

3.2 Introduction

Psychological capital (PsyCap) refers to an "individual's positive psychological state of development," characterized by the psychological resources of self-efficacy, hope, optimism, and resilience (Luthans, Youssef & Avolio, 2007, p. 3). Research has consistently demonstrated that PsyCap is positively related to a variety of job attitudes, behaviors and organizational outcomes (see Youssef &

Luthans, 2012). A recent meta-analysis has provided further evidence of significant, positive relationships between PsyCap and job satisfaction, organizational commitment, organizational citizenship behaviors (OCBs), and job performance; and negative relationships with turnover intent, cynicism, job stress and deviance (Avey, Reichard, Luthans & Mhatre, 2011). Moreover, although PsyCap predominately focuses on positivity at the individual-level, emerging research has also demonstrated positive associations between collective PsyCap and team performance (Clapp-Smith, Vogelgesang & Avey, 2009; Peterson & Zhang, 2011; Walumbwa, Luthans, Avey & Oke, 2011) and team OCBs (Walumbwa et al., 2011).

Despite rapid publication growth, a critical and synthesized analysis of PsyCap, in terms of its conceptualization and psychometric properties has yet to be conducted. It appears judicious to conduct such a review given that foundational research has now been established. There are currently in excess of 45 published PsyCap papers and the emergence of the first meta-analysis (Avey, Reichard et al., 2011) is further testament to the growth of PsyCap research. However, although this meta-analysis provides affirmation of the criterion utility of PsyCap, it does not critically evaluate other aspects pertaining to the *conceptualization* and *psychometric properties* of PsyCap and its measurement. Similarly, overviews by the founders of PsyCap (Youssef & Luthans, 2011; 2012) have also omitted critical evaluation of the conceptualization of PsyCap and its psychometric properties; instead focusing predominately on future applications of PsyCap.

Cautions have been raised in relation to new research paradigms which can run the risk of collective acceptance from those working in the field. Consequently, paradigms can suffer endorsement so strong that viable alternatives to studying the phenomenon can be overlooked (Hackman, 2009). As such, a greater diversity of

research perspectives (outside the founding PsyCap research team) needs to be encouraged so to avoid potential over-reliance on paradigm-sanctioned methodologies and to further advance the PsyCap paradigm. Therefore, we suggest this paper is timely as it extends extant review literature, by providing comprehensive analysis of the conceptual and psychometric foundations of PsyCap, and consequently highlighting areas for future research and construct development.

To this end, the paper firstly provides a review of the conceptual foundations of PsyCap to illustrate how it has been developed and differentiated from other ostensibly similar constructs. The merit, or otherwise, of including other components to PsyCap is also discussed. The second part of the paper investigates the strengths and areas of weakness pertaining to the psychometric profile of PsyCap, including elements of reliability, and both convergent and discriminant validity. As such, we provide a *psychometric-focused*, systematic review of published empirical studies that employ the PsyCap Questionnaire (PCQ; see Luthans, Youssef et al., 2007); the most frequently used instrument in the literature. Finally, a detailed discussion of current scoring procedures and consideration for alternate methods which may promote greater understanding of PsyCap is provided. Thus, although this paper complements previous reviews of PsyCap (Youssef & Luthans, 2011; 2012; Avey, Reichard et al., 2011), it provides a unique and independent contribution to the literature by explicitly discussing the need for further improvements pertaining to the conceptualization and measurement of PsyCap.

3.3 The conceptualization of PsyCap

Positive organizational behaviour (POB) is defined as "the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for

performance improvement in today's workplace" (Luthans, 2002, p. 54). Since its inception, several psychological capacities have been examined, both conceptually and empirically, from a POB perspective. To date, the four constructs deemed to best fit the POB inclusion criteria are *self-efficacy*, *hope*, *optimism*, and *resilience* (Luthans, Youssef et al., 2007). Attention is now being devoted to the synergy of these capacities as a core construct, known as PsyCap. PsyCap refers to a higher-order construct derived from a constellation of motivational and behavioral tendencies associated with self-efficacy ("having confidence to take on and put in the necessary effort to succeed at challenging tasks"); hope ("persevering towards goals and when necessary redirecting paths to goals"); optimism ("making a positive attribution about succeeding now and in the future"); and resilience ("when beset by problems and adversity, sustaining and bouncing back and even beyond to attain success"; Luthans, Youssef et al., 2007, p. 3).

Individually, each of the constructs has been studied for their relationship with a range of outcomes (see Luthans, Youssef et al., 2007). For instance, research has demonstrated positive relationships between self-efficacy, work performance (Stajkovic & Luthans, 1998) and work engagement (Salanova, Llorens & Schaufeli, 2011). Similarly, optimism is theorized as providing a motivational propensity which influences the amount of effort expended, thus enhancing job performance (Luthans, Avolio, Avey & Norman, 2007b).

Research has also supported relationships between hope and performance. Hope enables individuals to not only have willpower to pursue goals; but also facilitate the generation of multiple pathways to achieve goals (Snyder, 2002). Empirically this contention has been supported whereby more hopeful managers have higher performing work units (Peterson & Luthans, 2003). Finally, research has

demonstrated that resilience enables individuals to 'bounce-back' following a challenge and rebound with improved work performance (Luthans, Avey, Avolio, Norman & Combs, 2006).

It is reported that overall PsyCap produces higher correlations with performance outcomes than its components independently (Luthans, Avolio et al., 2007b). Consequently, PsyCap arguably has a synergistic effect, whereby the whole may be greater than the sum of its parts. It is purported that this effect occurs because PsyCap incorporates the coping mechanism(s) that the four individual components have in common (Avey, Reichard et al., 2011). This mechanism process is attributed to psychological resource theory (Hobfoll, 2002), which states that some constructs are indicators of broader, multidimensional 'core' factors, which aid individuals in producing favorable outcomes, such as job performance (Winkel, Wyland, Shaffer & Clason, 2011). Thus, although individual constructs may be psychometrically valid in their own right, they may be better understood as 'markers' of an overarching multidimensional core construct.

PsyCap and its individual components are described as 'state-like' (Avey, Luthans & Youssef, 2010). This assertion has been debated in the broader coping and positive psychology literature (e.g. for self-efficacy, see Bandura, 1997; hope, Snyder, 2002; resilience, Masten & Reed, 2002; and optimism, Seligman, 1998). Moreover, social psychology research has predominately conceptualized these variables as dispositional (Carver, Scheier, & Segerstrom, 2010), especially optimism. In contrast, clinical psychology has focused on intervening to enhance these variables, particularly within people coping with chronic illness (Steinhardt, Mamerow, Brown & Jolly, 2009). It is hardly surprising then that this disagreement and confusion in the broader psychological literature also exists in organizational

behavior where PsyCap proponents (Luthans, Youssef et al., 2007) report on-going debate as to whether PsyCap and its components are state-like in nature.

To address this issue conceptually, a continuum dichotomized by 'pure' poles of state and trait has been proposed; with PsyCap positioned as mid-range, thus 'state-like' (Luthans & Youssef, 2007). Thus, PsyCap is distinguished from very stable traits (e.g. intelligence; Schmidt & Hunter, 2000) and relatively stable traits and characteristics (e.g. The Big Five personality traits, Barrick & Mount, 1991; Core Self Evaluations, Judge & Bono, 2001), as PsyCap is positioned as malleable (Luthans, Avolio et al., 2007b) and open to development (Luthans, Avey, Avolio & Peterson, 2010). PsyCap is also differentiated from 'pure' states, such as moods and emotions, as PsyCap demonstrates relatively greater stability across time than transitory affect (Luthans, Avolio et al., 2007b).

Tentative support for the positioning of PsyCap as 'state-like' has been provided. Significant increases in PsyCap have been demonstrated through brief interventions, with small to medium effect sizes reported (d=.31-.40; Luthans et al., 2010). Evidence of within-person variability in PsyCap has also been reported, with a significant latent slope mean of -.07 (s. e. = 0.03, $p < 0.05$) demonstrating erosion in PsyCap across time (Peterson, Luthans, Avolio, Walumbwa & Zhang 2011).

However, what remains ambiguous are potential relationships between states and traits; and particularly, the relationship between dispositional traits and psychological states, such as PsyCap. For example, given that the PsyCap components have been conceived as both state- and trait-like in different literatures it could be expected that *state-like* self-efficacy, hope, optimism and resilience moderates or mediates the relationship between *trait-like* self-efficacy, hope, optimism and resilience and outcomes such as performance.

Similar relationships have been demonstrated in relation to other state/trait constructs. For example, the relationship between affectivity (trait) and work attitudes has been found to be mediated by (state) emotions at work (Grandey, Tam & Brauburger, 2002). Research has also demonstrated that after controlling for state optimism, trait optimism does not substantially increase the variance explained in predicting job performance (Kluemper, Little & DeGroot, 2009). Thus, although trait and state optimism may be similar in terms of self-regulatory and explanatory influences, their relationships with outcomes may differ due to the general versus context-specific nature of the outcomes. Although trait and state constructs may be clearly distinguished at either end of the continuum, the mid-range of the continuum is less clear. That is, the relationship between trait-like and state-like constructs appears more complex and thus the distinction between the two is often complicated. Although the state-trait debate is not unique to PsyCap (i.e. emotional intelligence has endured similar debate; see Ashkanasy & Daus, 2005), it remains a conceptual and empirical challenge for the paradigm.

Future Research Direction 1: Further theorization and investigation is needed to affirm the nature of each of the components of PsyCap and to further explore their relationships with more trait-like conceptualizations and with coping processes.

A proposed area for conceptual development is expansion of PsyCap so to encapsulate other capacities that meet POB criteria (Youssef & Luthans, 2012). Subsequently, PsyCap proponents have identified several psychological capacities for possible inclusion in PsyCap (Luthans, Youssef et al., 2007). These have been broadly categorized into four domains, cognitive (creativity, wisdom); affective (well-being, flow, humor); social (gratitude, forgiveness, emotional intelligence); and higher-order strengths (authenticity, spirituality, courage). Despite theoretical

identification of possible supplements to the PsyCap framework, to date empirical assessment relating to the 'fit' of any of these additional constructs is yet to be published. Consequently, expansion of the PsyCap nomological network is keenly cited as a future research direction, so that PsyCap can reach its full potential (Youssef & Luthans, 2011; 2012).

We do not discount the importance of investigating the potential to broaden and develop constructs. However, we caution this needs to be undertaken carefully so to avoid pitfalls encountered by other paradigms, such as emotional intelligence (EI). Debate surrounds the value of EI due to a lack of consensus regarding what EI is and what it includes (and importantly, what it is *not* and does *not* include; Locke, 2005). Several models of EI have been proposed, which cloud the operational definition of EI and if all were to be accepted, would render the concept meaningless (Cherniss, 2010). EI proponents acknowledge that the construct is now over-inclusive and that the development of different models has "done more harm than good" in establishing EI as a legitimate construct (Daus & Ashkanasy, 2003, p. 69). Consequently, EI researchers now face the challenge of refining and clarifying the concept and its models of measurement, so to determine which dimensions are most predictive of work outcomes and thus, most relevant to EI.

We recommend PsyCap researchers pay heed to the course of EI development and proceed methodically and systematically. We need to be cautious not to rush toward an 'all inclusive' approach to the point where we lose sight of which PsyCap components are actually meaningful to the outcomes of interest. Akin to making a remedial chicken soup, if we add too many 'ingredients' too quickly, we cannot fully understand which 'ingredients' predict, or interact to predict, relevant outcomes. Thus, PsyCap researchers need to clearly articulate the theoretical

frameworks that guide any future construct expansion (and corresponding item/scale selection for revised measures of PsyCap), so that PsyCap does not suffer similar conceptual and measurement problems as EI.

Luthans, Youssef et al. (2007) have provided general criteria for potential constructs to be assessed for future inclusive in the PsyCap umbrella. However, we suggest in the first instance, that further investigation be conducted with the existing PsyCap components, prior to selecting and evaluating additional dimensions. The next section of this paper will examine areas for further development of PsyCap as it currently stands and we argue that attention to these areas should be the first imperative for PsyCap research. Additionally, we will suggest that in order to understand how PsyCap predicts particular outcomes we need to breakdown analyses so to examine which components are most predictive of particular outcomes and under which circumstances. We propose that combining this line of research with sound theoretical frameworks might provide greater insight about *if* and *what* needs to be included (or excluded) in any future expansion of PsyCap.

Future Research Direction 2: Continued conceptual development of PsyCap is warranted, however any potential expansion should follow refinement of the construct as it currently stands and needs to be undertaken cautiously and methodically, with strong reference to relevant theoretical frameworks.

3.4 The Psychometrics of PsyCap

To assess the psychometric properties of PsyCap, we conducted a systematic review of the literature to locate published studies reporting information relevant to reliability and validity of PsyCap and its current methods of measurement. Multiple search strategies were used to maximize the probability of locating as many relevant articles as possible. First, computerized databases PsycINFO and Proquest were

searched using the search terms ‘Psychological Capital’ and ‘PsyCap’. Second, references from relevant articles were examined for additional articles. Third, references were identified through citations from review articles and book chapters (Little, Gooty & Nelson, 2007; Luthans, Youssef et al., 2007; Youssef & Luthans, 2011). Studies were included on the basis that (1) PsyCap was measured in its entirety and (2) PsyCap was quantitatively assessed in relation to at least one outcome and/or antecedent variable pertaining to employee functioning, such as performance, attitudes, behaviors, well-being. Several studies were excluded from this review on the basis of only including one or some of the PsyCap components (du Plessis & Barkhuizen, 2012; Jensen & Luthans, 2006; Luthans & Jensen, 2005; Luthans, Avolio, Walumbwa & Li, 2005; West, Patera & Carsten, 2009); or where individual measures for each of the components were implemented (Larson & Luthans, 2006; Little et al., 2007; Nguyen & Nguyen, 2012). Subsequently, 29 published (in English) studies were included and are presented in Tables 3-1 – 3-3.

Table 3-1

Descriptive Information and Statistics of the 29 Published Psychological Capital Studies Included in this Review

Study	PsyCap Measure	Data Type	Sample	Mean PsyCap (SD)
1. Avey, Avolio & Luthans (2011)	PCQ – Short Version (12 items)	SR	341 university employees	4.69 (.62)
2. Avey, Hughes, Norman & Luthans (2008)	PCQ	SR	106 engineers	4.56 (.70)
3. Avey, Luthans & Jensen (2009)	PCQ	SR	416 employees (CSI)	4.77 (.57)
4. Avey, Luthans, Smith & Palmer (2010)	PCQ	SR	280 employees (CSI)	4.78 (.61)
5. Avey, Luthans & Youssef (2010)	PCQ	SR	336 employees (CSI)	4.63 (.67)
6. Avey, Patera & West (2006)	PCQ	SR, OD	105 engineering managers	4.83 (.45)
7. Avey, Wernsing & Luthans (2008)	PCQ	SR	132 managers	4.56 (.63)
8. Chen & Lim (2012)	PCQ	SR	179 retrenched professionals	5.25 (.77)
9. Cheung, Tang & Tang (2011)	PCQ^	SR	264 teachers	4.23 (.71)
10. Clapp-Smith, Vogelgesang & Avey (2009)	PCQ	SR, OR, OD	89 retail employees (26 teams)	NR
11. Combs, Milosevic, Jeung & Griffith (2012)	PCQ – Short Version (12 items)	SR	380 undergraduate students	4.83 (.77)
12. Culbertson, Fullagar & Mills (2010)	PCQ	SR	102 community workers	4.70 (.51)

continued

Study	PsyCap Measure	Data Type	Sample	Mean PsyCap (SD)
13. Gooty, Gavin, Johnson, Frazier & Snow (2009)	PCQ	SR, OR	158 marching band members	4.48 (.76)
14. Hughes (2008)	PCQ	SR	87 employees (CSI)	4.11 (.70)
15. Luthans, Avey, Avolio & Peterson (2010)	PCQ	SR,OR	80 managers (CSI)	4.79 (NR)
16. Luthans, Avey, Clapp-Smith & Li (2008)	PCQ – Short Version (12 items)^	SR,OR	456 mining employees	4.33 (.46)
17. Luthans, Avolio, Avey & Norman (2007)	PCQ	SR, OR, OD	Study 1: 571 students Study 2: 1015 employees (CSI)	NR NR
18. Luthans, Norman, Avolio & Avey (2008)	PCQ	SR, OR, OD	Study 1: 404 students Study 2: 163 insurance employees Study 3: 170 engineers	4.33 (.41) 4.82 (.47) 4.67 (.51)
19. Luthans, Youssef, Rawski (2011)	PCQ	SR, OR	1526 employees (CSI)	NR
20. McMurray, Pirola-Merlo, Sarros & Islam (2010)	PCQ	SR	43 employees from NPO	NR
21. Norman, Avey, Nimnicht & Pigeon (2010)	PCQ – Short Version (12 items)	SR	199 employees (CSI)	4.61 (.82)
22. Peterson, Luthans, Avolio, Walumbwa, Zhang (2011)	PCQ	OR, OD	179 financial advisors	3.56 (.86)
23. Peterson & Zhang (2011)	PCQ	SR, OD	311 managers/67 teams	3.54 (.53)

continued

Study	PsyCap Measure	Data Type	Sample	Mean PsyCap (SD)
24. Rego, Marques, Leal, Sousa & Cunha (2010)	PCQ^	SR, OR	278 civil servants	3.9 - 4.0 (0.5)
25. Rego, Sousa, Marques, Cunha (2012a)	PCQ^	SR, OR	201 employees (CSI)	3.7 (.63)
26. Roberts, Scherer, Bowyer (2011)	PCQ	SR	390 (CSI)	3.55 (.46)
27. Walumbwa, Luthans, Avey & Oke (2011)	PCQ 8 items °	SR	526 bank employees (146 teams)	3.17 (.68)
28. Walumbwa, Peterson, Avolio & Hartnell (2010)	PCQ – 19 items	SR, OR	264 police sergeants & 79 police leaders	Followers: 2.97 (.50) Leaders: 2.92 (.74)
29. Woolley, Caza & Levy (2011)	PCQ – 12 items	SR	828 employees (CSI)	4.78 (.63)

Note. ^ Measures translated; ° Items adapted to the team referent; CSI: Cross Section of Industries; NPO: Not for Profit Organizations; NR: Not Reported; OD: Objective Data; OR: Other-Rater; SR: Self Report.

3.4.1 PsyCap Reliability

Our review illustrates that internal reliability for PsyCap has been consistent across studies. Table 3-2 shows all studies, with the exception of study 16, reported reliability alphas above the minimal acceptable 0.70 level (Leary, 2008). Moreover, studies which also examined the internal consistency reliability for the individual components have generally purported adequate findings. However, it is noteworthy that the internal consistency reliability for optimism (α = .63 -.69; studies 6, 16 & 26) and resilience (α = .63-.66; studies 11 & 16) tend to be consistently lower than those reported for self-efficacy and hope. One reason for this may be the inclusion of reverse-scored items in the optimism and resilience subscales, as reverse-scored items can reduce scale reliability (Schmitt & Stults, 1985). Research which has investigated this issue further seems to support this. For instance, study 13 used item analysis and found that dropping reverse-scored items improved the Cronbach's alphas from .66 to .80 for resilience, and .69 to .83 for optimism.

Similarly, confirmatory factor analysis (CFA) findings have indicated that removal of these items increased factor loading and improved model fit (studies 8, 13, 24). This raises question (particularly in relation to the optimism scale), as to whether a measure with reverse-scored items is assessing a single dimension with bipolar opposites (e.g. optimism and pessimism) or two distinct, but related constructs. This debate has surrounded the Life Orientation Test (LOT; Scheirer & Carver, 1985), the scale from which the PCQ optimism items are adapted, since its inception; with research demonstrating that positively and negatively worded items load onto separate factors (Chang & McBride, 1996). Proponents of a unidimensional conceptualization of optimism argue that the two-factor structure is the result of method bias, rather than a function of meaningful item content (Scheirer

& Carver, 1985). However, others suggest endorsing items with an optimistic outlook is substantially different from disagreeing with items which project a pessimistic outlook (Marshall & Lang, 1990). Kubzansky, Kubzansky & Maselko (2004) compared bipolar, bivariant and method artifact measurement models of the LOT and found optimism and pessimism emerged as two distinct factors and that each predicted health behaviors differently. Thus, considering these findings in relation to PsyCap we suggest that failure to consider optimism and pessimism as distinct constructs may not only reduce the reliability of a measure, but moreover reduce construct validity of PsyCap. As such, we encourage PsyCap researchers to be attentive to this issue and consider subsidiary analysis in which positively and negatively keyed items are examined separately so to investigate how each relates to the PsyCap model and outcomes of interest.

Although internal consistencies above the minimal conventional standard are generally reported, these findings are limited in their indication of PsyCap's overall reliability. Internal consistency reliabilities are considered to be the least conservative measure of reliability, particularly compared with test-retest reliability (Carmines & Zeller, 1979). Given the general premise regarding the stability of traits and fluctuation of states (Conley, 1984), it has been suggested that understanding a construct's stability over time may provide important information regarding state versus trait distinction, and that test-retest reliability comparisons provide an optimal method to assess this distinction (Avey, Luthans & Mhatre, 2008). However, only one study (17) has specifically examined PsyCap test-retest reliability, whereby PsyCap was reported to have lower test-retest reliability (α=.52) over a four-week period than 'trait-like' core self evaluations (CSE; α=.87), which arguably demonstrates the state-like nature of PsyCap. We suggest additional studies, outside

the core PsyCap authorship team (so to encourage independent replication), which demonstrate the test-retest reliability of PsyCap, particularly in relation to similar, albeit trait-like constructs, such as locus of control and CSEs, would further strengthen the psychometric profile of PsyCap and its definition as a state-like construct.

Table 3-2.

Reliability Properties of the 29 Published Psychological Capital Studies Included in this Review

Study	Reliability (α)				
	PC	S-E	H	O	R
1. Avey, Avolio & Luthans (2011)	>.70	-	-	-	-
2. Avey, Hughes, Norman & Luthans (2008)	.92	-	-	-	
3. Avey, Luthans & Jensen (2009)	.92	-	-	-	-
4. Avey, Luthans, Smith & Palmer (2010)	.93	.87	.87	.78	.72
5. Avey, Luthans & Youssef (2010)	.95	.92	.87	.78	.83
6. Avey, Patera & West (2006)	.90	.82	.81	.65	.78
7. Avey, Wernsing & Luthans (2008)	.95	-	-	-	-
8. Chen & Lim (2012)	.90	-	-	-	-
9. Cheung, Tang & Tang (2011)	.94	-	-	-	-
10. Clapp-Smith, Vogelgesang & Avey (2009)	.87	-	-	-	-
11. Combs, Milosevic, Jeung & Griffith (2012)	.91	-	-	-	-

continued

Study	Reliability (α)				
	PC	S-E	H	O	R
12. Culbertson, Fullagar & Mills (2010)		.86	.79	.86	.63
13. Gooty, Gavin, Johnson, Frazier & Snow (2009)	.88-.89	-	-	-	-
14. Hughes (2008)	.92	.77	.85	.92	.82
15. Luthans, Avey, Avolio & Peterson (2010)	> .90	>.70	>.70	>.86	>.70
16. Luthans, Avey, Clapp-Smith & Li (2008)	.68	-	-	-	-
17. Luthans, Avolio, Avey & Norman (2007)	.88 - .89	.75 - .84	.72 - .80	.69-.76	.66 - .72
Test Re-test:	PC α = .52				
18. Luthans, Norman, Avolio & Avey (2008)	.89-.91	-	-	-	-
19. Luthans, Youssef & Rawski (2011)	.81	-	-	-	-
20. McMurray, Pirola-Merlo, Sarros & Islam (2010)	.90	.78	.79	.70	.70
21. Norman, Avey, Nimnicht & Pigeon (2010)	.92	-	-	-	-
22. Peterson, Luthans, Avolio, Walumbwa, Zhang (2011)	.98	-	-	-	-
23. Peterson & Zhang (2011)	.98	-	-	-	-

continued

Study	Reliability (α)				
	PC	S-E	H	O	R
24. Rego, Marques, Leal, Sousa & Cunha (2010)	.76 (Four Dimension) .79 (Five Dimension)	.75	.76 .70 (willpower) .65 (pathways)	.74	.73
25. Rego, Sousa, Marques &Cunha (2012a)	.90	-	-	-	-
26. Roberts, Scherer & Bowyer (2011)	.89	.85	.80	.63	.81
27. Walumbwa, Luthans, Avey & Oke (2011)	.79	-	-	-	-
28. Walumbwa, Peterson, Avolio & Hartnell (2010)	.75- .88	-	-	-	-
29. Woolley, Caza & Levy (2011)	.88	-	-	-	-

Note. H: Hope; O: Optimism; PC: PsyCap; R: Resilience; S-E: Self-Efficacy.

Longitudinal research may also allow for investigation of the proposed state-like nature of PsyCap. This review identified only one true longitudinal study (22) whereby data was collected across three time points. This study used multiple-indicator latent growth modelling (MLGM) to demonstrate within person variability in PsyCap, thus providing support for the state-like nature of PsyCap (Peterson et al., 2011). As MLGM allows multiple items to represent a latent variable across time points (Chin, 1998), future longitudinal research incorporating such analyses could provide further confirmation of the state-like nature of PsyCap.

Future Research Direction 3: Future research aimed at further establishing the psychometric properties of PsyCap, with a particular focus on test-retest reliability and within subject variability implementing true longitudinal designs.

3.4.2 PsyCap Validity

Throughout the evolution of PsyCap, proponents have been eager to purport convergent and discriminant validity between PsyCap and other positive constructs, such as CSEs. CSEs refer to a multidimensional construct consisting of subconscious self-appraisals including, self-esteem, generalized self-efficacy, locus of control and emotional stability that affect an individuals' evaluation of themselves, others and their environment (Judge & Bono, 2001). Although conceptual similarities between PsyCap and CSEs are acknowledged (Avey, Luthans et al., 2010b), Table 3-3 indicates only two studies have investigated discriminant validity between PsyCap and CSEs. Study 22 reported significant, positive correlations between PsyCap and CSEs across three time points (r=.16, .25, .49); and study 17 reported a moderate, positive relationship between PsyCap and CSEs (r=.60). Although a correlation of .60 may be deemed by some researchers as strong, particularly given the conceptual

overlap, proponents argue that because of this overlap between PsyCap and CSEs some convergence is to be expected (Luthans, Avolio et al., 2007b).

Further discriminant validity evidence is reported in study 13; whereby CFA showed a significant distinction between collective PsyCap of followers and perceptions of transformational leadership. Similar findings are reported in study 1. CFA evidence has also demonstrated discriminant validity between PsyCap and perceived employability (8); creativity and authentic leadership (25); authentic leadership and positive work climate (29); and collective PsyCap and trust (27).

Although these findings are promising, we suggest it is insufficient evidence for establishing discriminant validity of a construct, particularly one rapidly gaining scholarly attention. Moreover, this lack of evidence is particularly worrisome given PsyCap's conceptual overlap with other constructs, including well-being, positive orientation and positive affect. For example, it was reported that the predictive power of PsyCap became insignificant once positive affect was accounted for in regards to performance; thus calling into question the distinction between PsyCap and positive affect (Little et al., 2007).

Table 3-3.

Validity Profile of the 29 Published Psychological Capital Studies Included in this Review

Study	Validity		
	Construct (CFA)	**Convergent & Discriminant**	**Predictive**
1. Avey, Avolio & Luthans (2011)		**Leader & Follower PsyCap** (Eigen value > 1)	**Leader PC → Follower PC:** F = 6.08*,η^2= .08 **Performance** β = .24*; β = .32**
2. Avey, Hughes, Norman & Luthans (2008)	SRMR = .05; RMSEA = .05; CFI = .96		**Empowerment:** β = .483** **Cynicism:** β = -.25** **Intent to Quit:** β = -.25**
3. Avey, Luthans & Jensen (2009)			**Intent to Quit**: β = -.24** **Job Search Behavior**: β = -.16**
4. Avey, Luthans, Smith & Palmer (2010)			**PWB**: β = .19**, R^2 = .59 **Health**: β = .12*, R^2 = .34
5. Avey, Luthans & Youssef (2010)	SRMR = .05; RMSEA = .05; CFI = .96		**Cynicism**: β = -.42*, R^2 = .32* **Intent to Quit:** β = -.27*, R^2 = .38* **OCB-Ind**: β = .17, R^2 = .38* **OCB – Org**: β = .22*, R^2 = .49* **CWB**: β = -.32*, R^2 = .29*

continued

Study	Validity		
	Construct (CFA)	**Convergent & Discriminant**	**Predictive**
6. Avey, Patera & West (2006)	CFI = .981; RMSEA = .025; SRMR = .065		**Involuntary Absenteeism**: R^2 = .06*
7. Avey, Wernsing & Luthans (2008)	CFI = .93; RMSEA = .06; SRMR = .05		**Engagement:** β = .43** **Cynicism:** β = -.40** **OCB:** β = .38** **Deviance:** -.46**
8. Chen & Lim (2012)	CFI = .96; TLI = .94; RMSEA = .08; SRMS = .07	**Perceived Employability:** $\Delta\chi^2$ = 12.20**	**Perceived Employability:** β = .66**
9. Cheung, Tang & Tang (2011)	CFI = .87; NFI = .82; RMSEA = .09		**Emotional Exhaustion:** r = -.50** **Depersonalization:** r = -.56** **Lack of achievement:** r =-50** **Job Satisfaction:** r = .28**
10. Clapp-Smith, Vogelgesang & Avey (2009)			**Performance:** β = .22; β = .16
11. Culbertson, Fullagar & Mills (2010)	$\chi^2(2)$ = 6.10; CFI = .98; RMSEA = .20; RMR = .01		**Well Being**: β = .75** **Happiness**: β = .28*
12. Combs, Milosevic, Jeung & Griffith (2012)			**Competence & Growth:** β = .49**
13. Gooty, Gavin, Johnson, Frazier & Snow (2009)	CFI = .95; SRMR = .07	**Follower Perception of Leadership*:*** ***r*** = .56**	**Performance**: β = .84* **OCB-Ind**: β = .65* **OCB-Org**: β = .63*

continued

Study	Validity		
	Construct (CFA)	**Convergent & Discriminant**	**Predictive**
14. Hughes (2008)			**Sense of Humor**: r = .30**
15. Luthans, Avey, Avolio & Peterson (2010)	SRMR = .05; RMSEA = .04; CFI = .95		**SR Performance:** r = .62** **OR Performance**: r = .23*
16. Luthans, Avey, Clapp-Smith & Li (2008)			**Performance**: β = .260**, ΔR^2 = .07**
17. Luthans, Avolio, Avey & Norman (2007)	**Study One:** SRMR= .051; RMSEA= .046; CFI= .934 **Study Two:** SRMR= .056;RMSEA= .048; CFI= .924	**Agreeable:** r = .06 **Openness:** r = -.10* **CSE:** r = .60* **ExtraVer:** r = .36* **Consc:** r = .39*	**Performance**: r= .33*; r= .22*
18. Luthans, Norman, Avolio & Avey (2008)	CFI = .97; RMSEA = .08; SRMR = .01		**Performance:** *β = .25**; β = .26**; β =.32*****
19. Luthans, Youssef & Rawski (2011)			**Innovation:** β = .24** **Mastery:** β = .15** **Future PC:** β = .66**
20. McMurray, Pirola-Merlo, Sarros & Islam (2010)	√		**Leadership**: β = .25**

continued

Study	Validity		
	Construct (CFA)	**Convergent & Discriminant**	**Predictive**
21. Norman, Avey, Nimnicht & Pigeon (2010)			**OCB-Org**: β = .39** **Deviance**: β = -.34**
22. Peterson, Luthans, Avolio, Walumbwa, Zhang (2011)	CFI = 1.00;TLI = 1.00 RMSEA = .05-.07;SRMR = .00	**CSE:** *r* = .16*; .25*;.49*	**OR Performance:** β = 2.08** **OD Performance:** β = 2.43**
23. Peterson & Zhang (2011)			**OD Unit Performance:** β= .64*
24. Rego, Marques, Leal, Sousa & Cunha (2010)	**Four-Factor Model:** RMSE = .07; GFI = .89; CFI = .87 **Five-Factor Model:** RMSE = .07; GFI = .90; CFI = .89		**SR Performance** **Four Dimension**: R^2 = .30* **Five Dimension**: R^2 = .33**
25. Rego, Sousa, Marques & Cunha (2012a)	RMSEA = .08; GFI = .82	**Leadership:** RMSEA = .19; GFI = .74 **Creativity:** RMSEA = .16; GFI = .78	**Creativity:** β = .49**
26. Roberts, Scherer & Bowyer (2011)			**Incivility:** *r* = -.23**

continued

Study	Validity		
	Construct (CFA)	**Convergent & Discriminant**	**Predictive**
27. Walumbwa, Luthans, Avey & Oke (2011)		**Collective Trust**: $\chi^2 = 156.53$**	**Authentic Leadership**: $\beta = .37$** **Collective OCB**: $\beta = .40$** **Collective Performance**: $\beta = .19$**
28. Walumbwa, Peterson, Avolio & Hartnell (2010)			**Leader PC→Follower PC:** $\tilde{y} = .52$** **Follower PC→Leader PC:** $\tilde{y} = .31$**
29. Woolley, Caza & Levy (2011)	RMSEA = .06; SRMR = .05	**Authentic Leadership & PWC** SRMR = .1; RMSEA = .1	**N/A**

Note.: * $p<.05$; ** $p<.01$; √ Analysis Conducted but Specific Results Not Reported; CFA: Confirmatory Factor Analysis; CFI: Comparative Fit Index; Consc: Conscientiousness; CSE: Core Self Evaluations; CWB: Counterproductive Work Behaviors; ExtraVer: Extraversion; GFI: Goodness of Fit Index; NFI: Normed Fit Index; OCB: Organizational Citizenship Behavior; OCB-Ind: Organizational Citizenship Behavior (Individual-Focused); OCB-Org: Organizational Citizenship Behavior (Organization - Focused); OD: Objective Data; OR: Other-Rater; PC: PsyCap; PWB: Psychological Well-Being; PWC: Positive Work Climate; RMR: Root Mean Square Residual; RMSEA: Root-Mean-Square Error of Approximation; SR: Self Report; SRMR: Standardized Root-Mean-Square Residual; TLI: Tucker Lewis Index.

Furthermore, the PsyCap components are posited as uni-factorial, with the exception of hope, which comprises of two subcomponents; willpower and pathways (Luthans, Youssef et al., 2007). However, evidence to support the factor structure of the PsyCap components appears scarce. Only one study (24) attempted to confirm the construct validity of the individual scales, demonstrating that hope loaded on two factors (willpower and pathways), in alignment with the conceptualization of PsyCap hope. The study also found that a five-factor model of PsyCap (whereby hope willpower and pathways were considered separately) yielded higher validity than a four-factor model (Rego, Marques, Leal, Sousa & Cunha, 2010). This is consistent with previous research implementing the State Hope Scale (Snyder et al., 1996), which has empirically demonstrated a two-factor model of hope (Rego, Machado, Leal & Cunha, 2009; Rego, Sousa, Marques & Cunha, 2012b). Although evidence for a four-factor structure of PsyCap has been well documented (see Table 3-3), we suggest further exploration of alternative factor structures may be warranted and could provide psychometric support for the conceptualization of the PsyCap hope component.

Future Research Direction 4: Further research be dedicated toward enhancing the construct validity profile of PsyCap, with a particular emphasis on discriminant and convergent validity of overall PsyCap; and alternate factor structures of PsyCap to reflect the conceptualization of each PsyCap component.

3.4.3 PsyCap Measurement

The PCQ (see Luthans, Youssef et al., 2007) is acknowledged as the standard measure for PsyCap. Twenty-two of the 29 studies reviewed utilized the measure in its complete form, while the remaining studies used abbreviated versions. Four studies (9, 16, 24 & 25) implemented translated versions and a further study (27)

modified items to a team-referent. Study 8 also modified the wording of items to reflect the context of the study (individuals searching for employment).

The PCQ was developed using pre-existing, published measures of self-efficacy (Parker, 1998); hope (Snyder et al., 1996); optimism (Scheier & Carver, 1985) and resilience (Wagnild & Young, 1993). Given that those measures varied in number of items and Likert scale points, as well as the degree to which they were state-like and relevant to the workplace, some items were modified or eliminated in developing the PCQ (Luthans, Youssef et al., 2007).

However, despite endorsement of the PCQ in the literature, the measure has also been criticized. Specifically, it has been suggested that much of the psychometric validation for the original scales included in the PCQ were conducted in non-organizational settings (Little et al., 2007). Luthans et al. (2010) concede the methods used to construct the PCQ may undermine the construct validity of the PCQ and PsyCap. Consequently, further measurement refinement is needed so to further enhance the construct validity of PsyCap.

Additionally, we suggest that the PCQ scoring procedures require further clarity. The current procedure requires the 24 items be summed to give a total score out of a possible 144 points. However, studies appear to report scores as an overall mean, calculated from the mean subscale scores; thus giving a score out of 6. This aggregated score is interpreted as a reflection of an individual's overall PsyCap level, with higher scores indicating more positive PsyCap. This scoring procedure is commonplace for multi-dimensional tests with correlated dimensions. When subscales are correlated, one can expect that an individual who scores highly on one subscale will also score highly on the other subscales (Furr & Bacharach, 2008). Thus, by focusing on the composite score, an assumption is made that the four

components of PsyCap are inter-related and contribute equally to overall PsyCap. However, of the 10 studies (4-6, 12, 14, 15, 17, 20, 24 & 26) that have reported inter-correlations between the four components the range of correlations is wide (.63-.92).

Whilst CFA addresses some of these issues by factoring in subscale variation in the prediction of PsyCap as a latent variable and was reported in 15 of the 29 studies reviewed, only eight studies (8, 10, 11-13, 25, 27 & 29) employed structural equation modelling (SEM) using PCQ data. SEM has advantages over running a CFA followed by multiple regression analyses, in that SEM estimates multiple and interrelated dependence in a single analysis, therefore the model fit indices, error indices and modification indices indicate missing paths that may improve overall fit of the model (Clapp-Smith et al., 2009).

One further study (22) used MLGM to assess within individual changes in PsyCap across time and the relationship between these changes and changes in subsequent performance. MLGM extends conventional latent growth modelling by using multiple items to represent a latent variable at each time point; thus measurement errors and unreliability are more accurately represented using this approach (Chin, 1998). In addition, study 28 implemented hierarchical linear modelling as it was concerned with data which multilevel in nature.

However, the remaining 19 studies have relied on multiple regression or correlational analyses. Thus, we recommend future research expand statistical analyses conducted with the PCQ so to include SEM. This will serve to increase the construct validity of PsyCap and its composite score; and to better understand how the individual components contribute to overall PsyCap and organizational outcomes. We suggest that continued reliance on a composite PsyCap score, *without* first conducting more in-depth analyses of the construct by way of CFA *and* SEM,

PsyCap research could be dismissing the importance of examining an individual's PsyCap profile.

Future Research Direction 5: More sophisticated analyses of the PCQ is warranted to gain a better understanding of the interplay between the subcomponents of PsyCap and to further validate the use of a composite PCQ score.

To further illustrate the shortcomings of a composite PsyCap score, consider employee A, who scores highly (30 out of a possible 36) across all four scales to obtain a composite score of 120 out of a possible 144. In comparison, employee B scores high (34 out of 36) on the resilience and self-efficacy scales, but lower (26 out 36) on the hope and optimism scales to also obtain a score of 120. Thus, two employees generate the same composite scores, yet these scores reflect quite different PsyCap profiles; which in turn may have very different relationships with performance and other outcome variables.

This issue has been exemplified in research predicting job performance. When the second-order factor of PsyCap was entered into the regression analysis after each of the individual components, no additional unique variance was explained in relation to self-report employee performance. However, when the order was reversed and the individual components were entered after overall PsyCap, an additional 9% of variance was explained (Rego et al., 2010).

Furthermore, by examining each of the components individually, rather than using the composite score, differential relationships between each component and outcome variables can be investigated. For instance, Rego et al. (2010) reported that only optimism, hope willpower, and resilience were significant predictors of performance. This finding allowed propositions to be made regarding potential

neutralizers (i.e. organization evaluation processes) which may have reduced the association between self-efficacy and hope pathways and performance. Again, these findings and their implications would have been overlooked if only a composite score was implemented.

We further suggest that analyzing the individual components in conjunction with the composite score would allow for what we term *PsyCap profiling*. Although we acknowledge that the PsyCap components are related and thus, individuals may score similarly across all four components; it is likewise conceivable, given that the components are posited as sufficiently distinct from one another (Luthans, Avolio et al., 2007b) that individuals could vary across the four components. PsyCap profiling would enable researchers to determine types of employees who may encompass particular PsyCap configurations and begin to understand how particular PsyCap profiles relate to outcomes differently. For example, a newly employed graduate might demonstrate high PsyCap optimism and hope, stemming from enthusiasm typical of commencing a new career; however relatively lower self-efficacy and resilience due to a lack of experience in the role and limited history of overcoming career-specific challenges. Conversely, a more experienced, tenured employee might demonstrate higher PsyCap self-efficacy and resilience due to successful experiences in their role and a record of overcoming setbacks; yet experience lower optimism and hope due to a lack of inspiration and creativity stemming from being in the same role for many years. Thus, although these two employees could conceivably have similar overall PsyCap scores, their PsyCap profiles may have very different bearings on performance and other relevant outcomes, such as turnover intent and job satisfaction. PsyCap profiling could also be complemented by emerging research demonstrating a potential neurological component to PsyCap, which differentiates

individuals with lower or higher psychological capacities (Peterson, Balthazard, Walderman & Thatcher, 2008).

PsyCap profiling could also provide insight into how particular organizational cultures or practices impact upon employee PsyCap. Rego et al. (2010) proposed that aspects of organizational appraisal processes have the potential to neutralize elements of PsyCap. For instance, irregular performance appraisals may not provide ample opportunity for employees to obtain an external gauge regarding their performance and areas of strength and consequently self-efficacy could be negatively affected. Similarly, given that hopeful employees tend to be independent thinkers with a need for autonomy to utilize their agency (Luthans, Youssef et al., 2007), PsyCap hopefulness may be eroded in a strict *boss commands/employee obeys* organizational context (Rego et al., 2010).

The implications of PsyCap profiling could also extend to PsyCap intervention practices. For example, if an organization was specifically interested in reducing turnover, interventions could be tailored so to place emphasis on developing the particular PsyCap components, or combinations of components, associated with lower turnover intentions. However, in order to progress the utility of PsyCap in such a manner greater understanding is needed regarding the interplay between the components and this cannot be achieved by solely relying on a composite score of PsyCap.

Future Research Direction 6: Ancillary analysis using the individual component scores of PsyCap should be incorporated in future research so to enhance predictive validity, and increase understanding regarding mechanisms of effect of PsyCap and potential neutralizers of PsyCap.

3.5 Practical Implications

This paper has provided a comprehensive psychometrically-focused review of PsyCap. We have positioned six directives to guide future research, with the intention of improving the conceptualization and measurement of the construct. However, we also see a number of important practitioner implications stemming from our recommendations. Firstly, by developing an understanding regarding potential moderating and mediating relationships between the state-like PsyCap components and their trait-like counterparts and other trait-like constructs such as Big Five personality traits and CSEs (akin to relationships demonstrated in relation to state/trait affect, Grandey et al., 2002; and state/trait optimism; Kluemper et al., 2009); managers could more readily identify employees whose functioning could be bolstered by enhancing their state-like PsyCap. Similarly, this knowledge could help managers recognize employees at greater 'risk' of variable or eroded positivity and would therefore benefit from intensive PsyCap development.

Secondly, improved psychometrics, particularly in relation to construct validity, will ensure that managers and organizations are able to assess employee PsyCap with greater accuracy and strength. This, in turn, will provide more rigorous information regarding the positivity of staff, and evaluating the need for, and effectiveness of, PsyCap interventions.

Thirdly, suggestions for considering the individual components scores in conjunction with composite scores will provide greater insight into the mechanisms of effect of PsyCap in relation to desirable (and undesirable) work outcomes. This information will allow managers to pin-point PsyCap components most relevant to their employees' core work and priorities the development of these capacities among their staff. This line of enquiry may also highlight particular organizational practices

and cultures which neutralize (or conversely, foster) particular elements of PsyCap and thereby impact on certain aspects of employee functioning. Finally, PsyCap profiling, whereby the composition of an employee's PsyCap is considered, may also provide managers, HR personnel or Employee Assistance Program providers with a more comprehensive picture of employee positivity and areas of likely strength.

3.6 Conclusion

This paper has provided a critical review of the POB construct, PsyCap. Although it is evident from previous overviews (Youssef & Luthans, 2011; 2012) that PsyCap has ignited scholarly interest as reflected in the burgeoning publications; this review has concentrated on providing a unique and detailed evaluation of the conceptualization and psychometric underpinnings of the construct. To achieve this undertaking we conducted a systematic review of 29 PsyCap studies and subsequently proposed six directives for future research aimed at strengthening the construct and its utility in OB research and practice.

The first directive relates to fostering a deeper knowledge regarding the interplay between state-like PsyCap and more trait-like constructs and coping processes. Understanding potential moderating and mediating relationships between the PsyCap components and their trait-like counterparts could enhance the utility of PsyCap in terms of strengthening relationship between dispositional traits and desirable work-related outcomes, including performance. Our second directive regards the impetus within current PsyCap literature to expand the construct to include other components, such as creativity, humor and courage. We have drawn on recent EI literature to caution against a hurried and atheoretical approach to this line of enquiry; instead imploring researchers to firstly focus on improving the construct as it currently stands, before moving to expand the PsyCap umbrella. In particular,

we argue that understanding how the individual components contribute, or interact to contribute, to outcome variables will inform future research regarding the need for (or otherwise), and suitability of, additional components to the PsyCap construct.

Our third and fourth directives relate to improving the psychometric profile of the construct. The review demonstrated that although efforts have been made to convey the psychometric foundations of PsyCap, there is room for improvement, particularly relating to test-retest reliability, and convergent and discriminant validity. Furthermore, to reduce the likelihood of paradigm-sanctioned methodologies and promote a greater diversity of research perspectives, we encourage researchers outside the founding PsyCap team to incorporate stronger psychometric focus in their research.

Our fifth directive highlights the need for more sophisticated methods of analysis so that we can gain a more comprehensive understanding of the composite PsyCap score and how each component of PsyCap contributes to this score. The final directive encourages researchers to incorporate ancillary analysis of the individual components in addition to the composite PsyCap score. We argue that this will provide the greatest insight into understanding PsyCap and maximizing its potential in the workplace.

We see that endorsement of these directives will serve three important functions. Firstly, from a research perspective, these directives are imperative in forming a research agenda which will further strengthen the conceptualization and measurement of PsyCap. Secondly, several potential practical implications stemming from this research agenda have been highlighted. These include improved identification of employees who may benefit from PsyCap development; more accurate assessment of employee positivity and workplace interventions aimed at

enhancing staff positivity; and greater understanding of the mechanisms of effect of PsyCap, which would allow for identification of organizational practices which improve (or otherwise) staff PsyCap. Finally, we are hopeful that this research agenda will stimulate interest in the construct from a broader spectrum of researchers, so to provide a more developed and enriched understanding of PsyCap and its applications in the workplace.

3.7 Post Script

This chapter has provided a critical systematic review of the PsyCap construct, focusing particularly on aspects pertaining to its theoretical and psychometric properties. Twenty-nine studies were included in the review. Descriptive information, along with data relating to the reliability and validity of the PsyCap construct was extracted from each study and presented in the chapter.

The review highlighted a series of theoretical and psychometric shortcomings of the construct and its primary measure, the PCQ. Consequently, six directives were proposed to further enhance the conceptualization and measurement of the construct and enhance its utility in the workplace.

The following chapter addresses one of these directives by investigating the additional utility of using a four-factor model of PsyCap in comparison to the conventional second-order model for furthering understanding of criterion validity and illuminating differential mechanisms of effect of PsyCap components in relation to two key work attitudes reflecting satisfaction and wellbeing.

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Chapter 4: Maximizing the positives: Criterion validity of lower and higher order factor models of Psychological Capital in relation to the satisfaction and wellbeing of SME owner/managers.

4.1 Preface

The previous chapter presented a systematic review of extant PsyCap literature, with particular emphasis on assessing the theoretical and psychometric foundations of the construct. The review suggested that although PsyCap has largely been conceptualized as a second-order construct, greater insight into the construct's mechanisms of effect[1] may be garnered via more detailed consideration of the individual PsyCap components. It was further suggested, that analyses incorporating the individual components may enhance the criterion validity of the construct.

This chapter addresses this directive by investigating differences in the utility of a four-factor model of PsyCap (whereby the components are considered separately) and the conventional second-order model (using a composite PsyCap score) in explaining variance in reported job satisfaction and job tension among owner/managers working in the SME sector. Additionally, the chapter explores whether specific PsyCap component factors differentially explain variance in these outcomes; thereby offering initial insight into the mechanisms of effect of PsyCap.

At the time of submission of this thesis, the contents of this chapter had been submitted as a manuscript to *Journal of Applied Behavioral Science*.

[1] The terms 'mechanism of effect of PsyCap' and 'effect mechanisms of PsyCap' are used interchangeably throughout this thesis to refer to the differential relationships each of the individual components of PsyCap may have with outcome variables. As such, the terms as they are used here, are not intended to imply a mediation model of effect.

4.2 Introduction

Managers and business owners working in the small-to-medium enterprise (SME) sector encounter unique challenges and job demands, including multiple role responsibilities, long working hours and limited human resources and organizational support (Cocker, Martin, Scott, Venn & Sanderson, 2013). Prolonged exposure to these stressors can place individuals at increased risk for the psychological effects of job strain; including burnout, anxiety, depression and impaired well-being (Bakker & Demerouti, 2007). Consequently, the development of strategies and resources designed to protect SME owner/managers from the adverse effects of job strain has been identified as a key priority for occupational health research (Cocker et al., 2013; Murphy, 2007).

Psychological Capital (PsyCap) is one such resource thought to endow individuals with psychological hardiness to better cope with job-related demands (Baron, Franklin & Hmieleski, 2013). Conceptualized as a second-order variable comprised of hope, optimism, resilience and self-efficacy (Luthans, Youssef & Avolio, 2007), previous findings have indicated that in addition to its positive effects on job performance, PsyCap is positively related to well-being and job satisfaction (Avey, Luthans, Smith & Palmer, 2010; Cheung, Tang & Tang, 2011; Luthans, Avolio, Avey & Norman, 2007) and negatively related to job stress and tension (Avey, Luthans & Jensen, 2009; Baron et al., 2013).

However, despite support for a second-order model of PsyCap, recent research has demonstrated that greater variance was explained in dependent variables when the PsyCap factors were analyzed individually, in comparison to using a composite PsyCap score (Rego, Marques, Leal, Sousa & Cunha, 2010). Furthermore, it has been suggested that investigation of the individual factors of PsyCap in the

prediction of outcome variables could offer greater insight into the mechanisms of effect of PsyCap, and importantly, more accurately inform the design of tailored intervention programs aimed at enhancing PsyCap which meet the specific needs of the individual and their work context (Dawkins, Martin, Scott & Sanderson, 2013).

Therefore, the aims of this study are twofold. First, we aim to determine whether a four-factor model of PsyCap provides additional criterion validity in relation to SME owner/managers' job satisfaction and job tension compared to a second-order PsyCap model (using a composite PsyCap score, as recommended by Luthans, Avolio et al., 2007). Second, by using a four-factor model we aim to establish whether specific individual PsyCap factors are more important in explaining variance in these outcomes. As such, our findings will not only contribute theoretically by offering more precise insight into the mechanisms of effect of PsyCap; but also inform intervention practices in terms of identifying and prioritizing the development of the PsyCap factors most relevant to indicators of SME owner/manager well-being. Before proceeding to a discussion of the hypotheses and methods of the current study, we provide a brief review of the theoretical underpinnings of PsyCap and its relationship with indicators of job related well-being.

4.3 The Building Blocks of PsyCap

PsyCap is a defined as an "individual's positive psychological state of development," characterized by hope, self-efficacy, resilience and optimism (Luthans, Youssef et al., 2007, p. 3). Prior research has shown that individually each of these capacities is positively related to indicators of well-being, including job satisfaction, and negatively associated to job stress. For instance, individuals high in hope are able to generate multiple pathways to goal achievement and when

necessary, redirect efforts and pathways, thereby reducing the impact of stressors (Snyder, 2000) and promoting job satisfaction (Luthans & Youssef, 2004). Highly efficacious individuals have confidence to achieve goals and put in the required effort to overcome challenges, therefore reducing experiences of job-related stress (Schwarer & Hallum, 2008) and enhancing job satisfaction (Stajkovic & Luthans, 1998). Resilience enables individuals to rebound, and even beyond, to achieve goals when faced with adversity. Consequently, resilience enables individuals to better cope with job-related tension (Tugade & Fredrickson, 2004) and promotes job satisfaction (Youssef & Luthans, 2007). Finally, individuals high in optimism hold positive attributions about succeeding which provides a buffer against the effects of job tension (Totterdell, Wood & Wall, 2006) and heightens perceptions of job satisfaction (Youssef & Luthans, 2007).

4.4 PsyCap's Mechanisms of Effect?

PsyCap has been positioned as a higher-order, latent construct comprised of the four factors of hope, self-efficacy, resilience and optimism. This second-order model of PsyCap has been ubiquitously implemented in the extant literature concerned with this construct. A recent review revealed that almost every PsyCap study that reported a confirmatory factor analysis of the PsyCap Questionnaire (PCQ; Luthans Youssef et al., 2007) provided support for a second-order composite, by way of reporting acceptable model fit indices (Dawkins et al., 2013). This practice appears to stem from a seminal study in the area which found that the second-order construct of PsyCap had higher correlations with performance outcomes than any of its individual components alone (Luthans, Avolio et al., 2007). Thus, it is commonly suggested that PsyCap has a synergistic effect on positive outcomes, whereby the

whole (PsyCap) may be greater than the sum of its parts (Avey, Wernsing & Luthans, 2008; Luthans, Youssef et al., 2007).

It is suggested that this synergistic effect occurs because PsyCap incorporates the coping mechanism(s) that the four factors have in common (Avey, Reichard, Luthans & Mharte, 2011). This mechanism process is attributed to psychological resource theory (Hobfoll 2002), whereby it is suggested that some constructs (i.e. hope, self-efficacy, resilience, optimism) are indicators of broader, multidimensional 'core' factors (i.e. PsyCap). Thus, although the individual constructs may be psychometrically valid in their own right, they can also be considered as 'markers' of an overarching multidimensional core construct (Avey et al., 2011). To help illustrate this theoretical position, Avey et al. (2011) drew parallels with other organizational behaviour constructs including core self evaluation traits (Judge & Bono, 2001), transformational leadership (Antonakis, Avolio & Sivasubramaniam, 2003) and empowerment (Spreitzer, 1995); where each construct is considered a second-order factor consisting of shared variance between individual predictive components.

Previous research has indicated that overall PsyCap is positively related to desirable attitudes, including job satisfaction and well-being (Avey et al., 2010; Cheung et al., 2011; Luthans, Avolio et al., 2007) and negatively related to undesirable attitudes, including stress and job tension (Avey et al., 2009; Avey et al., 2011). Relevant to the present study, recent research concerned with stress and well-being among entrepreneurs indicated that PsyCap was negatively related to stress, and in turn, stress was negatively related to entrepreneurs' well-being (Baron et al., 2013). A primary explanatory mechanism of these effects of PsyCap is that individuals with higher PsyCap expect good things to happen at work (optimism), believe they create their own successes (hope and self-efficacy) and persevere in

response to challenges (self-efficacy) (Avey et al., 2011). Thus, according to PsyCap theory, each of the individual components is essential in contributing to the mechanism of effect of PsyCap.

However, it has been argued that more precise understanding regarding the effect mechanisms of PsyCap can be garnered by incorporating auxiliary analysis using a four-factor model of PsyCap, whereby each of the PsyCap factors are considered individually (Dawkins et al., 2013). This line of argument has been exemplified in research predicting job performance, which demonstrated that a four-factor model of PsyCap provided an additional 9% explained variance in comparison to overall PsyCap (using a second-order model) (Rego et al., 2010). Moreover, analysis of the individual indicators of PsyCap allowed for investigation of the relationships each component had with job performance. Specifically, it was reported that only optimism, hope willpower, and resilience were significant predictors of performance (Rego et al., 2010). Thus, a four-factor model of PsyCap allowed for inferences to be made regarding potential neutralizers (e.g. organization evaluation processes) of the PsyCap factors, which in turn influence specific outcome variables, such as performance. These inferences would not be possible exclusively using the second-order PsyCap model in the analysis, as is currently common practice in the literature.

Additionally, it has been suggested that implications of analyses using the four-factor model of PsyCap could extend the evidence base around PsyCap intervention practices (Dawkins et al., 2013). Developing an understanding of how each of the individual factors relates to outcomes variables may allow for more targeted interventions and evaluation studies. For instance, and of particular relevance to the SME sector, an organizational priority may be reducing job stress.

As such, interventions could be tailored so as to place emphasis on developing the particular PsyCap factors, or combination of factors, most strongly associated with job stress specific to the SME context. However, to progress the utility of PsyCap in this way greater understanding is needed regarding the interplay between the individual components of PsyCap via auxiliary analyses implementing the four-factor model of PsyCap.

4.5 The Current Study

The current study has two primary foci: 1) to investigate the potential for additional criterion validity in the prediction of job satisfaction and job tension by implementing auxiliary analysis using a four-factor model of PsyCap; and 2) to identify which PsyCap factors have the strongest relationships with job satisfaction and job tension in a sample of SME owner/managers.

As reviewed above, previous research has demonstrated that individually, hope, self-efficacy, resilience and optimism have positive relationships with job satisfaction (i.e. Luthans & Youssef, 2004; Stajkovic & Luthans, 1998; Youssef & Luthans, 2007) and negative relationships with job tension and job strain (e.g. Schwarzer & Hallum, 2008; Snyder, 2000; Totterdell et al., 2006; Tugade & Fredrickson, 2004). Moreover, research dedicated to the compilation of these factors (i.e. PsyCap) has also demonstrated positive associations with job satisfaction (Cheung et al., 2011; Luthans, Avolio et al., 2007) and negative relationships with job stress and tension (Avey et al., 2009; Baron et al., 2013). Thus, at a most basic level of investigation we expect that PsyCap will be positively related to job satisfaction and negatively related to job tension, regardless of the construct model employed in the analyses.

Hypothesis 1: PsyCap will be positively related to job satisfaction and negatively related to job tension, regardless of the factor model implemented.

However, based on emerging research comparing the criterion validity of the two models of PsyCap (Rego et al., 2010) we expected that additional variance will be explained in the outcome variables by using a four-factor model of PsyCap. Thus, we hypothesized:

Hypothesis 2: The four-factor model of PsyCap will explain additional variance over the second-order model in the relation to job satisfaction and job tension.

By incorporating analyses using the four-factor model we have argued that we will be better positioned to affirm the relative contribution of the individual PsyCap factors in relation to the outcome variables of job satisfaction and job tension. Based on the research reviewed above demonstrating the relationships hope, self-efficacy, resilience and optimism has with job satisfaction and job tension and the general explanatory effect mechanism of PsyCap (Avey et al., 2011), we expected that each of the individual PsyCap factors would positively relate to job satisfaction and negatively relate to job tension. Accordingly, we hypothesized:

Hypothesis 3a: Analyses using the four-factor model of PsyCap will demonstrate that each of the individual factors of PsyCap has a positive relationship with job satisfaction.

Hypothesis 3b: Analyses using the four-factor model of PsyCap will demonstrate that each of the individual factors of PsyCap has a negative relationship with job tension.

Although we expected that each of the individual PsyCap factors would contribute meaningfully to the prediction of the outcome variables, we were also

interested in garnering a more precise understanding of the effect mechanisms of PsyCap in relation to job satisfaction and job tension. Although previous research has reported that only some of the PsyCap factors were significantly related to employee job performance (Rego et al., 2010), to date no studies have compared the relationships each of the PsyCap factors has with job satisfaction and job tension. Thus, given the exploratory nature of this research objective, we positioned the following research question:

Research Question: Which PsyCap factors have the strongest effects on job satisfaction and job tension?

4.6 Method

4.6.1 Sample and Procedure

Data was collected from owner/managers taking part in a study examining the feasibility and efficacy of a workplace mental health promotion program targeted at SME owner/managers (Martin, Sanderson, Scott & Brough, 2009). To be eligible to participate in the study owner/managers needed to be in a managerial role within a business employing less than 200 employees.

Owner/managers from the SME sector were invited to participate in the research survey via multiple recruitment strategies including small business seminars, online and print adverts and business association mailing lists. Potential participants registered their interest in the research by accessing a dedicated website, which provided further information about the study, including its voluntary nature. Registered owner/managers were then sent the survey material (see Appendix A) either online via a secured site, or in pencil and paper format, if preferred.

The data analyzed here represents the baseline data provided by 193 owner/managers, prior to randomization to a research trial group. 20.7% of

respondents worked in the services industry, while a further 15% worked in health and 7.3% in retail. Other industry sectors represented were building and construction (6.2%); finance (4.1%); information technology (4.1%); manufacturing (4.1%); transport (4.1%) and tourism (3.1%). In addition, a small proportion of managers represented the agriculture (1.6%); mining (0.5%) and wholesale (1.6%) sectors. A further 27.5% of respondents identified with an 'other' industry sector not specified in the survey. Most respondents indicated that they were responsible for supervising less than five staff members (72.8%), while 21.4% supervised 5-19 staff and, 4.8% supervised a staff of more than 20 employees.

Among the respondents, 109 (56.6%) were female. The majority of respondents were aged between 40-49 (35.2%), while the remainder was aged 18-29 (8.8%), 30-39 (24.9%), 50-59 (23.8%) and 60 years or older (7.3%). Most respondents (51.8%) had completed a university degree, 21.8% had completed a diploma, 4.7% had completed senior high school, 10.4% had completed high school (to grade 10) and 11.4% had completed some other form of educational qualification.

4.6.2 Measures

PsyCap was assessed with the 24-item PsyCap Questionnaire (PCQ; Luthans, Youssef et al., 2007). Permission to use the PCQ was obtained through the www.mindgarden.com permissions process. The scale includes six items for each of the four factors (hope, self-efficacy, resilience and optimism). Example items include: *"I feel confident helping to set targets/goals in my work area"* (self-efficacy); *"If I should find myself in a jam at work, I could think of many ways to get out of it"* (hope); *"When I have a setback at work, I have trouble recovering from it and moving on"* (reversed; resilience); and *"When things are uncertain for me at work I usually expect the best"* (optimism). Each item is rated using a 6-point Likert

scale (1=strongly disagree, 6=strongly agree). Reliability for this scale was good (Cronbach's alpha was $\alpha = .94$).

Job Satisfaction was assessed in both samples using a 3-item scale (Warr, Cook & Wall, 1979). Example items include, *"Overall, I am satisfied with the kind of work I do"* and *"Overall, I am satisfied with my job."* A 5-point Likert scale from (1=strongly disagree, 5=strongly agree) was used for item rating. Reliability for this scale was found to be acceptable across both samples ($\alpha = .84$ - $.89$)

Job Tension was assessed using a 7-item measure (House & Rizzo, 1972). This measure was selected to provide a reflection of manager job strain, rather than a global measure of job stress and has been used in other research investigating job strain (i.e. Hochwarter, Perrewé, Hall & Ferris, 2005; Vigoda, 2002). Responses are on a 6-point Likert scale (1=strongly disagree, 6=strongly agree). Example items include *"Problems with my job have kept me awake at night"* and *"I work under a great deal of tension."* Reliability for this measure was acceptable ($\alpha = .84$).

4.7 Results

Descriptive statistics and correlations at the factor level were calculated and are shown in Tables 4-1 and 4-2.We then conducted confirmatory factor analyses (CFA) on the second-order and four-factor models to examine criterion validity using MPlus 6.12 (Muthén & Muthén, 2011). Complete CFA results for each of the models of PsyCap on each dependent variable are presented in Appendices C-F.

Goodness of fit was assessed using the χ^2-test, the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), Standardized Root-Mean-Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA).

Table 4-1

Descriptive Statistics and Correlations for Each PsyCap Factor and Job Tension in the Job Tension Model.

	Mean	SD	1	2	3	4	5
1. Hope	4.34	.97	-				
2. Self-Efficacy	4.83	.96	.80**	-			
3. Resilience	4.40	.75	.79**	.70**	-		
4. Optimism	4.18	.86	.75**	.59**	.75**	-	
5. Job Tension	29.9	6.64	-.42**	-.33**	-.41**	-.47**	-

Note Means and standard deviations are calculated from raw data.

**$p < .001$

Table 4-2

Descriptive Statistics and Correlations for Each PsyCap Factor and Job Satisfaction in the Job Satisfaction Model.

	Mean	SD	1	2	3	4	5
1. Hope	4.34	.97	_				
2. Self-Efficacy	4.83	.96	.80**	_			
3. Resilience	4.40	.75	.79**	.70**	_		
4. Optimism	4.18	.86	.74**	.59**	.74**	_	
5. Job Satisfaction	11.30	2.90	.50**	.44**	.32**	.54**	_

Note Means and standard deviations are calculated from raw data.

**$p < .001$

Typically, adequate model fit is indicated by a non-significant χ^2-test, a CFI ≥ .90, SRMR ≤ .08 and RMSEA ≤ .08 (Hu & Bentler, 1999). As evident in Table 4-1, each of the models demonstrated reasonable model fit in relation to the CFI, SRMR and RMSEA indices. However, significant χ^2-tests and were found for each of the models. As this test is strongly influenced by sample size and model complexity (Russell, 2002), we followed Hu and Bentler's (1999) combinatorial rule that two of three indices should meet cut-off recommendations. Accordingly, and as shown in Table 4-3, both models displayed satisfactory model fit for each of the outcome variables. However, chi-square difference analyses between the two models revealed significant chi-square differences between the two models for each outcome variable (Job Satisfaction: $\Delta\chi2 = 27.35$, $df = 5$, $p < .005$; Job Tension: $\Delta\chi2 = 14.43$, $df = 5$, $p < .025$), favoring the four-factor model in both cases.

Figures 4-1a-b and 4-2a-b illustrate that although both models significantly predict job satisfaction and job tension; more variance is explained in each of the outcome variables when the four-factor model of PsyCap is implemented. Thus, our first two hypotheses were fully supported.

Figures 4-2a-b also shows the relative contribution of each of the individual PsyCap factors in the prediction of job satisfaction and job tension. Each of the factors had a positive relationship with job satisfaction, with the exception of resilience, thereby providing only partial support for hypothesis 3a. Moreover, Figure 4-2b shows that each of the factors had a negative relationship with job tension, with the exception of self-efficacy (β =.04, n/s). Again, these results only provide partial support for hypothesis 3b.

Table 4-3

Goodness-of-Fit Indicators for the Models of PsyCap for Job Satisfaction and Job Tension

DV/Model	*Df*	χ^2	χ^2/df	$\Delta\chi^2$	CFI	TLI	RMSEA	SRMR
Job Satisfaction								
Second-Order Model	319	687.06**	2.15		.89	.88	.08	.07
Four-Factor Model	314	659.75**	2.10	27.31**(5)	.89	.88	.08	.07
Job Tension								
Second-Order Model	429	798.72**	1.86		.89	.88	.07	.07
Four-Factor Model	424	784.29**	1.85	14.43*(5)	.89	.88	.07	.07

Note CFI = comparative fit index; DV = dependent variable; TLI = Tucker Lewis index; SRMR = standardized root-mean-square residual; RMSEA = root-mean-square error of approximation

*$p < .025$ ** $p < .005$

It should be noted that in the four-factor model of PsyCap the beta weight for the resilience factor in the relationship with job satisfaction is significantly negative (Figure 4-2a). This finding is in contradiction with previous research which has demonstrated positive associations between resilience and job satisfaction (e.g. Youssef & Luthans, 2007) and demonstrates the importance of understanding the mechanisms of effect of PsyCap at the individual factor level.

Analysis of the structural equation model of the four-factor model of PsyCap also enabled us to investigate which PsyCap variables were the best predictors of the outcome variables. Figures 4-2a and 4-2b illustrate that optimism was the strongest predictor of both job satisfaction (β = .55, p < .001) and job tension (β = -.32, p < .05). Moreover, in each instance, optimism represented the only significant predictor of each outcome variable. These results suggest that optimism is key to enhancing job satisfaction and may also serve as an important buffer against job tension for SME owner/mangers. The remaining PsyCap factors were not significantly related to job satisfaction or job tension.

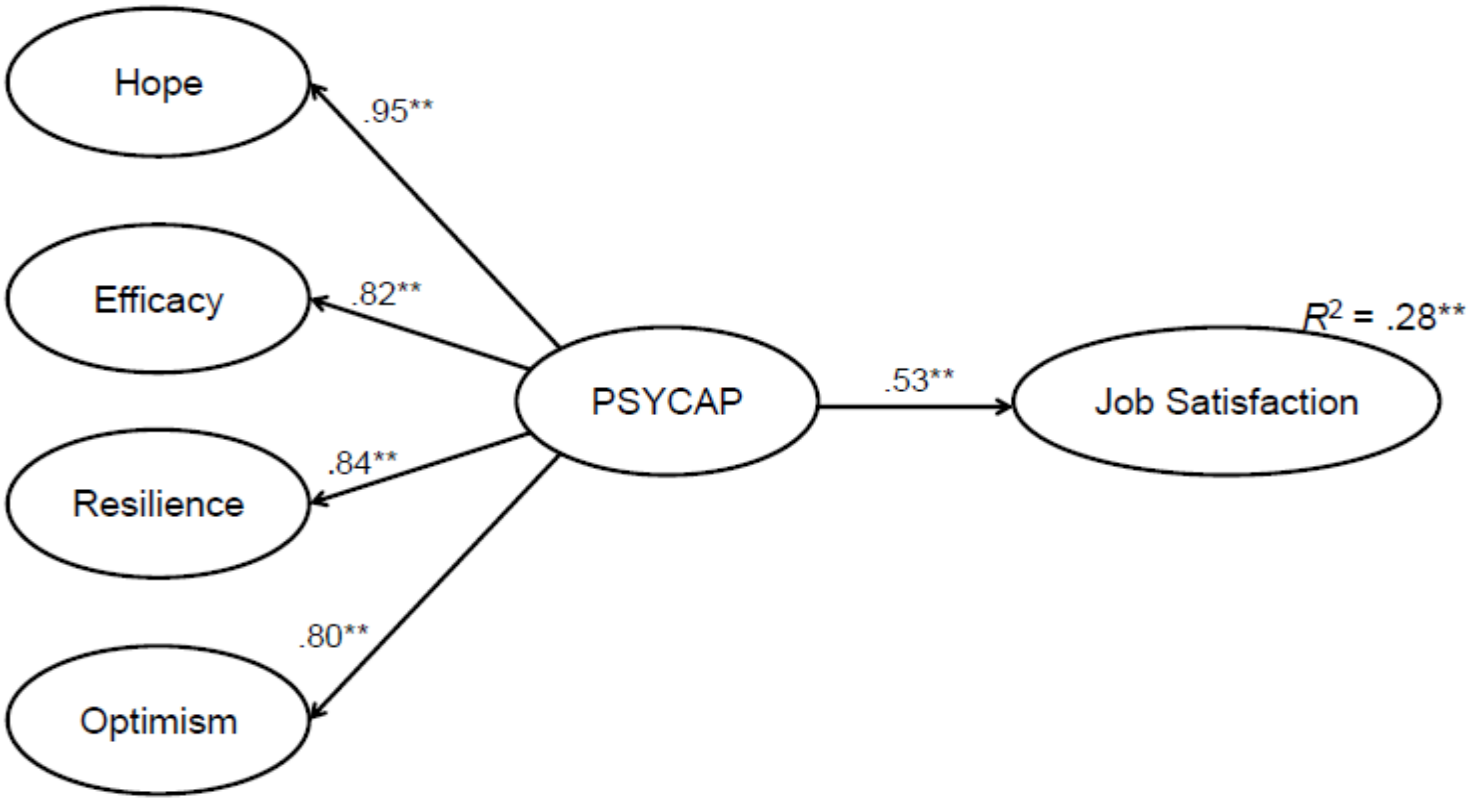

Figure 4-1a. Beta weights and R-Square for the second-order model of PsyCap and job satisfaction.

** $p < .001$

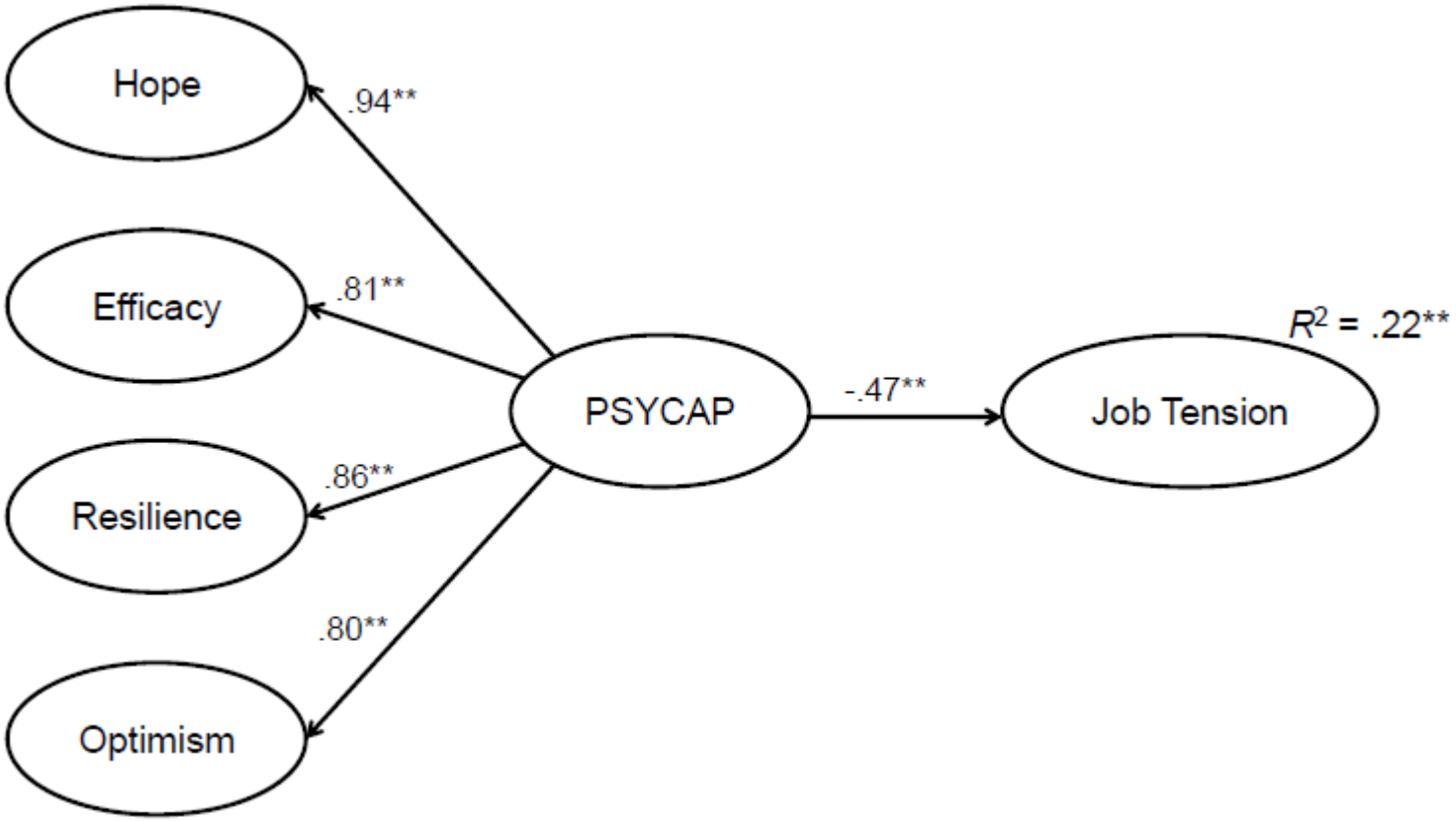

Figure 4-1b. Beta weights and R-Square for the second-order model of PsyCap and job tension.

** $p < .001$

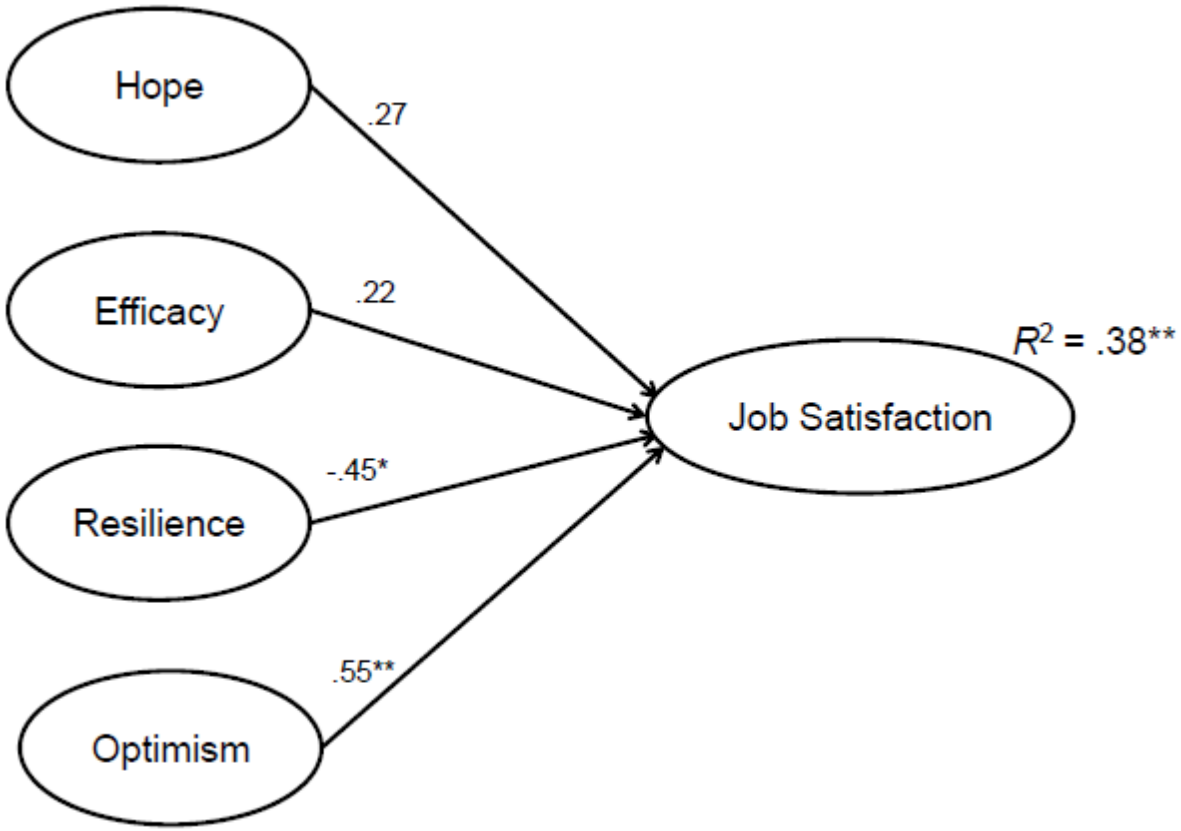

Figure 4-2a. Beta weights and R-Square for the four-factor model of PsyCap and job satisfaction.

* $p < .05$ ** $p < .001$

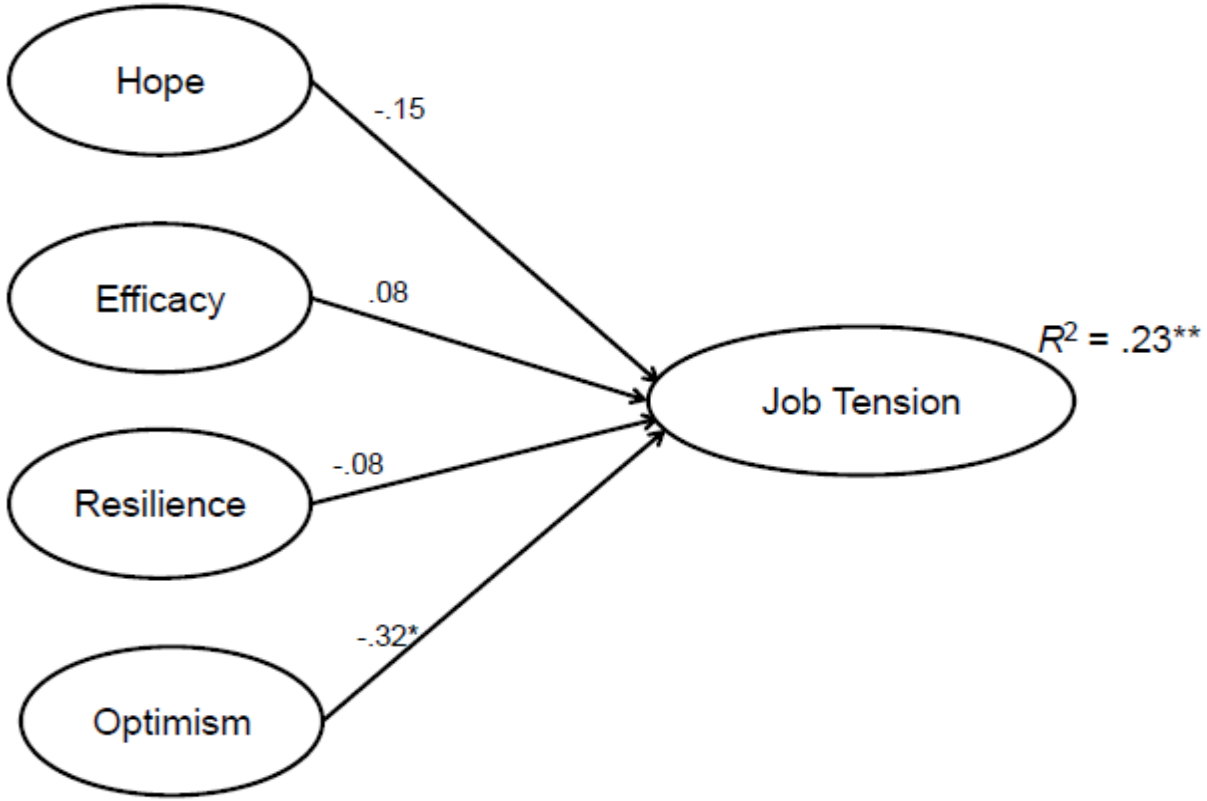

Figure 4-2b. Beta weights and R-Square for the four-factor model of PsyCap and job tension.

* $p < .05$ ** $p < .001$

4.8 Discussion

It has been suggested that the unique job demands and challenges inherent in the SME context can place owner/managers working in this sector at high risk of poor job related well-being (Cocker et al., 2013). The construct of PsyCap, which encompasses hope, self-efficacy, resilience and optimism, has been posited as a developable resource, which can provide an effective buffer to the ill-effects of job stress and thereby promote well-being (Avey et al., 2009). The findings from the current study support this contention, demonstrating that SME owner/manager PsyCap was negatively related to job tension and positively associated with perceptions of job satisfaction. Additionally, our findings are consistent with previous research which reported that entrepreneurs' level of PsyCap was negatively related to job stress (Baron et al., 2013).

However, this study has extended current understandings of PsyCap by examining the comparative criterion validity of a four-factor model and a second-order model in relation to indicators of SME owner/manager well-being. Our analyses showed that a four-factor model of PsyCap provided greater explained variance in relation to each outcome variable compared to the conventional second-order model of PsyCap. Although the increases in explained variance using a four-factor model were relatively small (e.g. 1% for job tension and 10% for job satisfaction), our findings follow earlier research which reported that a four-factor model of PsyCap provided additional criterion validity compared to a second-order model in the prediction of employee job performance (Rego et al., 2010). Taken together, these findings suggest that researchers risk losing predictive power of dependent variables if they fail to consider the components of PsyCap separately. As such, the potential buffering effect of PsyCap against job stress purported in previous

research incorporating the conventional second-order model of PsyCap (e.g. Avey et al., 2009; Baron et al., 2013) may be considerably understated.

This study also sought to provide more precise insights into the mechanisms of effect of PsyCap in relation to SME owner/manager job tension and job satisfaction. As such, we investigated whether particular PsyCap factors were more relevant in explaining variance in these outcome variables. Our findings showed that optimism was the sole significant predictor of both owner/manager job satisfaction and job tension. This suggests that the degree to which SME owner/managers expect positive outcomes and attribute these outcomes to internal, permanent causes (optimism) is particularly important in determining the extent to which they feel content within their job. Additionally, optimism appeared particularly important in providing a buffer against managers' perceptions of job-related tension. This is consistent with previous research which reported that individuals with higher levels of optimism were less likely to experience the effects of workplace stress (Totterdell et al., 2006).

Our findings are also in alignment other research which has investigated the differential relationships the PsyCap components have with outcome variables (Rego et al., 2010), whereby PsyCap optimism was found to be a significant predictor of employee job performance. However, unlike the present study, Rego et al. (2010) reported that PsyCap resilience and hope (willpower) were additional predictors of job performance. This suggests that the mechanisms of effect of PsyCap may vary across different outcome variables and job roles. Thus, future research should be encouraged to investigate potential differences in the contribution of the individual PsyCap components across various work populations and outcomes pertinent to optimal organizational functioning.

Overall, the findings from the present study support the benefits of PsyCap in terms of promoting indicators of well-being (e.g. enhanced job satisfaction and lower job tension) among SME owner/managers. However, our findings also highlight the added benefits of incorporating a four-factor model of PsyCap in analyses, either in place of, or in addition to, a second-order model. Specifically, we have demonstrated that a four-factor model not only provides greater explained variance in outcome variables, but also allows for more exact insights into the mechanisms of effect of PsyCap. This insight could better inform organizational practices geared towards enhancing employee functioning and well-being.

4.9 Theoretical and Practical Implications

The findings described above hold important implications for both theory and practice. First, our study extends PsyCap research into a new organizational setting – the SME sector. SMEs are typically a neglected sector in organizational research, despite the sector representing the most common work setting in most economies (Martin et al., 2009). Moreover, the vast majority of PsyCap research to date has focused on employees and managers working in mid to large-sized companies and organizations. Given the unique nature of the SME sector, it is not appropriate to assume that findings from larger organizations will apply to individuals working in smaller enterprises (McMurray, Pirola-Merlo, Sarros & Islam, 2010). Thus, this study builds on emerging research investigating the application of PsyCap in different work contexts (e.g. the not-for-profit sector, McMurray et al., 2010; and entrepreneurs, Baron et al., 2013; Hayek, 2012), by examining how PsyCap applies to SME owner/managers.

Second, our findings demonstrate the importance of including the four-factor model of PsyCap, either as an alternative to the second-order model, or in auxiliary

analyses. In particular, our results suggest that researchers risk losing predictive power in relation to common indicators of job related well-being if they fail to consider the PsyCap components separately.

Consideration of a four-factor model of PsyCap also holds important practice implications. Most notably, this model allows for more information to be garnered in terms of determining which factors are most important in relation to specific outcome variables. Thus, managers can identify which are the most relevant PsyCap capacities to their workplace based on those outcomes most pertinent to their business's functioning. As such, tailored interventions aimed at enhancing those particular PsyCap capacities could be developed and implemented. For example, if a business was specifically interested in reducing job tension, interventions could be tailored so to place emphasis on developing the particular PsyCap components (e.g. optimism), or combinations of components, associated with reduced job tension.

This may be particularly relevant to SME owner-operators and managers who are often constrained in terms of resources (e.g. time, financial and personnel) to engage in extended human resource development training (Lindstrom 2004; Martin et al., 2009). It would also further contribute to PsyCap literature by determining whether it is necessary to develop each separate component of PsyCap, or if it is possible to produce enhancements in functioning by focusing on the development of one or two components of PsyCap (Luthans, Avey, Avolio & Peterson, 2010).

Finally, by considering the factors of PsyCap independently greater insight could also be developed regarding potential organizational or contextual factors that enhance or inhibit particular factors of PsyCap, which in turn positively (or negatively) influences aspects of employee functioning. Previous research has suggested a social-contagion effect of PsyCap, whereby the PsyCap of leaders and

their staff are positively related (Walumbwa, Peterson, Avolio & Hartnell, 2010). This may be particularly relevant to the SME sector, given that managers usually work in close proximity to employees. Furthermore, as a notable proportion of SMEs operate as sole traders; many individuals working in these enterprises work in relative isolation, with limited exposure to positive interactions with colleagues which may serve to bolster PsyCap. The potential impact of a lack of social interaction at work on individuals' PsyCap warrants further investigation.

4.10 Limitations

All empirical research encompasses limitations and this study is no exception. First, the dependent and independent variables were collected simultaneously from the same source, making the study potentially vulnerable to common method bias (Podsakoff, Mackenzie, Lee & Podsakoff, 2003). Future studies could incorporate temporal separation of measurements to help reduce the potential effect of common method variance. This would not however eliminate the potential for inflated positive self-report. Given that the variables in this study are subjective in nature, they are arguably best evaluated by self-report (Spector, 2006). Thus, multisource ratings would have been an inappropriate way to measure these variables. Rather, a practical extension for future research may be longitudinal research designs which examine the mechanisms of effect of PsyCap in the prediction of outcome variables across time.

Finally, although a strength of this study was the use of an *in situ* work sample, it must be noted that the study employed non-probability, convenience sampling. Although there are disadvantages of using convenience samples, most notably constraining the generalizability of the findings, their use is relatively cost and time efficient in comparison to probability sampling techniques. Although this

method is commonly employed in PsyCap research (i.e. Avey et al., 2008; Baron et al., 2013; Jensen & Luthans, 2006), future studies could test these hypotheses employing random sampling techniques.

4.11 Conclusion

The construct of PsyCap has been positioned as a resource which can promote employee well-being by enhancing job satisfaction and providing a buffer to the effects of job-related demands. The current study supports this contention by demonstrating that PsyCap positively relates to job satisfaction, and negatively relates to job tension among owner/managers working in the SME sector. However, we have suggested that the beneficial effects of PsyCap may be currently under-estimated within the literature. We have demonstrated that a four-factor model of PsyCap can provide greater variance in outcome variables compared with a second-order model, and importantly, allow for more precise understandings regarding the mechanisms of effect of PsyCap. These findings contribute empirically by extending PsyCap research into the SME sector and theoretically by offering insight into the effect mechanisms of PsyCap. The results also inform practice in terms of identifying and prioritizing the development of the PsyCap factors most relevant to indicators of SME owner/manager well-being.

4.12 Post Script

This chapter followed on from the systematic review in Chapter 3 by examining the additional utility of a four-factor model of PsyCap in explaining variance in outcome variables. This chapter demonstrated that a four-factor model provided additional criterion validity compared to the conventional second-order model. The four-factor model also enabled identification of those PsyCap factors most related to the outcomes of interest. As such, we encourage PsyCap researchers

to implement the four-factor model of PsyCap in analyses, either in place of, or in addition to, the second-order model. We argue that this will provide the greatest insight into understanding processes of PsyCap development and therefore maximizing its potential in the workplace.

The following chapter focuses on the notion of collective PsyCap by undertaking a theoretical analysis and development approach to investigate and extend current conceptual frameworks of collective versions of the PsyCap construct.

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Chapter 5: Advancing conceptualization and measurement of Psychological Capital (PsyCap) as a collective construct.

5.1 Preface

Psychological Capital (PsyCap) has been conceptualized as an individual-level construct concerned with an employee's state of positive psychological development. However, research has now started to examine PsyCap as a collective phenomenon in three studies to date. Although these studies have demonstrated positive associations between team-level PsyCap and team-level functioning, there has been limited synopsis regarding the conceptualization and measurement foundations of PsyCap at higher-levels of analysis. This chapter extends collective PsyCap scholarship by adopting a multilevel-multireferent framework to explore alternate conceptualizations of collective PsyCap. The framework furthers our understanding of PsyCap at higher-levels by exploring unique antecedents and emergent processes relating to each form of collective PsyCap. Subsequently, the chapter culminates in the proposition of a number of testable propositions to guide future research.

The text that follows is included in a manuscript that has been reviewed and invited for resubmission in *Human Relations*.

5.2 Introduction

In an increasingly competitive 'flat-world' (Friedman, 2005), it is essential organizations understand and foster their employee's positive psychological capabilities to ensure optimal performance and functioning (Ouweneel, Le Blanc,

Schaufel & van Wijhe, 2012). Positive organizational behavior (POB) encompasses research concerned with positive human strengths applicable to the workplace (West, Patera & Carsten, 2009) which are measurable, impactful on performance and open to development (Luthans, 2002). Psychological Capital (PsyCap) is a higher-order POB construct defined as an "individual's positive psychological state of development," characterized by the psychological resources of self-efficacy, hope, optimism, and resilience (Luthans, Youssef & Avolio, 2007, p. 3). Recent meta-analytic evidence suggests it is an important predictor of job performance, job satisfaction, organizational commitment, organizational citizenship behaviors (OCBs), turnover intentions and well-being (Avey, Reichard, Luthans & Mharte, 2011).

Although PsyCap has predominantly been studied at the individual-level, recent calls have been made to investigate the potential for a collective version of the construct by examining PsyCap in teams and larger collectives (Luthans, Youssef et al., 2007; Youssef & Luthans, 2011). These calls are in alignment with a growing reliance on team-based structures within organizations (Glassop, 2002) and increased research efforts aimed at expanding our understanding of team processes and team performance (Chou, Wang, Wang, Huang & Cheng, 2008; Gundlach, Zivnusha & Stoner, 2006; Kang, Yang & Rowley, 2006). More broadly, this line of enquiry has demonstrated value in conceptualizing how individual-level characteristics can combine at the team level to have a relationship with both team-level outcomes (Bell, 2007) and cross-level relationships with individual-level outcomes (Troth, Jordan, Lawrence & Tse, 2012).

Subsequently, a small number of studies have now devoted attention to the notion of *collective* PsyCap (i.e. Clapp-Smith, Vogelgesang & Avey, 2009; Petersen

& Zhang, 2011; Walumbwa, Luthans, Avey & Oke, 2011). Although these studies have provided initial empirical support for collective PsyCap, there has been limited exploration of the theoretical frameworks and measurement issues pertaining to collective PsyCap. This omission in the literature is concerning given the importance placed on establishing strong theoretical frameworks to support both the conceptualization and operationalization of aggregated constructs (Kozlowski & Klein, 2000).

This paper aims to build upon emerging collective PsyCap research by undertaking three functions. First, we will provide an overview of the theories relating to the *extant* conceptualization and definition of collective PsyCap, including collective efficacy theory and contagion principles. In doing so, we will explore current operationalizations of collective PsyCap before proposing alternate conceptualizations of collective PsyCap. These alternate forms of collective PsyCap will be introduced by employing a multilevel-multireferent framework that differentiates collective PsyCap according to level of analysis and referent. This multilevel-multireferent framework is positioned as imperative for improving the clarity of the conceptualization of collective PsyCap. Finally, several testable propositions are provided to guide future collective PsyCap research designed to help to 'build out' the understanding of PsyCap at higher levels and promote its application in management practice.

5.3 Individual-level PsyCap

PsyCap refers to a higher-order construct derived from a constellation of motivational and behavioral tendencies associated with self-efficacy ('having confidence to take on and put in the necessary effort to succeed at challenging tasks'), optimism ('making a positive attribution about succeeding now and in the

future'), hope ('persevering towards goals and, when necessary redirecting paths to goals'), and resiliency ('when beset by problems and adversity, sustaining and bouncing back and even beyond to attain success') (Luthans, Youssef et al., 2007, p. 3).

Support for PsyCap as a higher-order core construct has been provided both conceptually (Luthans, Youssef et al., 2007) and empirically (see Avey et al., 2011). Confirmatory factor analyses have demonstrated initial support for a core underlying factor whereby the shared variance or commonality between each facet comprises the higher order factor, PsyCap (Luthans, Avolio, Avey & Norman, 2007).

PsyCap and its individual components are considered 'state-like' in nature (Avey, Luthans & Youssef, 2010). This state-like concept is supported by a theoretical distinction between PsyCap and other organizational behavior constructs including Big Five traits and core self-evaluations. This distinction is based on a continuum perspective dichotomized by 'pure' poles of state and trait. PsyCap is positioned as midrange and therefore a 'state-like' construct which is relatively malleable and open to development (Luthans, Youssef et al., 2007). It is differentiated from both stable, fixed traits (e.g. Big Five, core-self evaluations) and pure, transient states (e.g. moods and emotions). Empirically, convergent and divergent evidence between PsyCap and other related positive constructs has been provided to further support the state-like nature of PsyCap and its overall construct validity (see Dawkins, Martin, Scott & Sanderson, 2013 for detailed psychometric review of PsyCap construct).

5.4 Collective PsyCap

Although PsyCap literature has focused almost exclusively on the assessment and development of PsyCap at the individual-level, research is now exploring the

notion of *collective PsyCap*. Thus far, three studies have examined PsyCap at a collective (i.e. team) level (see Table 5-1). These studies have demonstrated positive relationships between team-level PsyCap and team performance (Clapp-Smith et al., 2009; Peterson & Zhang, 2011; Walumbwa et al., 2011) and organizational citizenship behaviors (Walumbwa et al., 2011).

These studies provide some early support for the notion of a collective PsyCap construct at the team level. However, review of these studies highlights a critical need for detailed examination of explicit theoretical frameworks to support the conceptualization and operationalization of collective PsyCap. As demonstrated in Table 5-1, the extant studies are divergent in their approach to the conceptualization and measurement of collective PsyCap. Only two studies (Peterson & Zhang, 2011; Walumbwa et al., 2011) have explicitly defined the concept of collective PsyCap. Based on collective efficacy theory (Bandura, 1997), collective PsyCap is defined as "the *group's shared* psychological state of development that is characterized by [hope, efficacy, optimism, and resilience]" (Peterson & Zhang, 2011; Walumbwa et al., 2011). Thus, according to this proposition, there is a suggested 'synergistic' effect that occurs within teams to produce collective PsyCap.

It is also evident from Table 5-1 that the studies have approached the measurement of collective PsyCap differently. Clapp-Smith et al. (2009) and Peterson and Zhang (2011) implemented a direct-consensus approach to aggregate individual PsyCap to the team-level; while Walumbwa et al. (2011) used a referent-shift approach. Exactly what these measurement approaches represent and the implications of these differences will be further discussed in this paper.

Given these current inconsistencies and limited synopsis regarding the conceptualizations and operationalizations of collective PsyCap, it is timely to

provide an in-depth exploration of both the theoretical frameworks for collective PsyCap and the relevant models of composition. Our intention here is not to position that one conceptualization and operationalization is superior over another. Rather, we aim to explore the possibility of extending current conceptualizations so to encompass alternate forms of collective PsyCap; each of which may emerge through different team processes, and thus, relate to antecedents and outcomes differently. However, before proceeding to such analyses it is necessary to consider the theoretical foundations cited to support extant conceptualizations of collective PsyCap.

5.5 Theoretical underpinnings for collective PsyCap

Two foundational theories have been cited to support the aggregation of PsyCap. These are collective efficacy theory (Bandura, 1997) and what we will term as *contagion theories*, which includes both cognitive and emotional contagion principles. However, although reference to each of these theories has been made in the existing collective PsyCap literature, in each instance this has been cursory. In particular, the theoretical justification for the conceptualization (and subsequent operationalization) for team-level PsyCap has been largely neglected. Thus, we will review each of these theories in detail before examining how each relates to various multilevel measurement approaches.

Table 5-1

Theoretical and Empirical Summary of Extant Collective PsyCap Studies

Study	Theoretical Framework	Conceptual Definition	Level of Measurement	Level of Analysis
Clapp-Smith, Vogelgesang & Avey (2009)	Social Cognitive Theory and Social Contagion Theory (Bandura, 1977, 2001; Meindl, 1995)	NR	Direct Consensus Composition PCQ – 24 items **Example Items:** *"I feel confident helping set targets/goals in my work area"*	Structural Equation Modeling
Peterson & Zhang (2011)	Collective Efficacy Theory (Bandura, 1997)	"the *group's shared* psychological state of development that is characterized by [hope, efficacy, optimism, and resilience]"	Direct Consensus Composition PCQ – 24 items **Example Items:** *"I feel confident helping set targets/goals in my work area"*	Hierarchical Regression
Walumbwa, Luthans, Avey & Oke (2011)	Collective Efficacy Theory (Bandura, 1997, 2006, 2008)	"the *group's shared* psychological state of development that is characterized by [hope, efficacy, optimism, and resilience]"	Referent Shift Composition PCQ – 8 items **Example Items:** *"Members of this group confidently contribute to discussions about the group's strategy"*	Structural Equation Modeling

Note NR., Not Reported; PCQ., Psychological Capital Questionnaire (Luthans, Youssef et al., 2007).

5.5.1 Collective efficacy theory

The concept of collective efficacy was proposed as an extension of self-efficacy theory (Bandura, 1986), in an attempt to explain group choices, effort and persistence. It is defined as a "group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainment" and said to emerge as a "product of the interactive and coordinative dynamics of its members; interactive dynamics create an emergent property that is more than the sum of the individual's attributes" (Bandura, 1997, p. 477). Collective efficacy is positioned as a unique construct from that of self-efficacy, in that group members become aligned in their beliefs regarding the group's ability through shared cognitions. These shared cognitions (collective efficacy) arise through processes of social interaction regarding the group's capabilities. Thus, although collective efficacy has its foundations in the cognitions of individual group members, the alignment of these beliefs collectively transcends the sum of individual self-efficacies of group members.

Much like individuals regulate their own behaviors in response with their own self-efficacy beliefs, groups also regulate their behaviors and attitudes in response to the shared belief regarding the efficacy of the group. For example, collective efficacy is purported to be directly related to team performance, whereby higher collective efficacy predicts better team performance (Stajkovik & Luthans, 1998). This relationship has been attributed to a group's shared belief that it can manage a particular task, which in turn, influences a team to initiate action and determine how much effort a team will put in and for how long they will exert effort (Stajkovik, Lee & Nybery, 2009).

As outlined earlier, collective PsyCap literature makes reference to collective efficacy theory to support the aggregation of PsyCap from the individual to the team-level (Petersen & Zhang, 2011; Walumbwa et al., 2011). It is suggested that collective PsyCap shares the same formation processes as collective efficacy, specifically, "the interactive and coordinative dynamics of its members" (Bandura, 1997, p. 477). Thus, according to this reasoning, the social interaction and synergistic processes inherent to teams is critical to the emergence of team-level PsyCap.

5.5.2 Contagion theories

Not dissimilar to collective efficacy theory, contagion theories purport that team members become similar in their beliefs, attitudes and emotions through communication and social interaction. Thus, thoughts and feelings regarding team functioning are communicated among team members; in a similar manner to how an infectious disease spreads from one individual to the next (Degoey, 2000). Although contagion principles have not been applied extensively to collective PsyCap literature, these theories have been applied to other organizational phenomena. Researchers have referred to contagion processes to explain similarities within work teams in relation to mood (Totterdell, Kellett, Teuchmann & Briner, 1998), job satisfaction (Krackhardt & Porter, 1985), organizational commitment (Hartman & Johnson, 1989), perceptions of leadership (Meindl, 1993) and job stress (Barley & Knight, 1992).

Contagion theories distinguish between cognitive (or social) contagion and emotional contagion. *Cognitive contagion* (also referred to as social contagion) is the process of communicating and exchanging information among members of a collective which results in a shared perception regarding some aspect pertinent to the team (Degoey, 2000). Thus, individuals adopt the attitudes and beliefs of others who

influence them. In contrast, *emotional contagion* refers to the process by which an individual's emotional response is influenced by the emotional responses of other members within the collective; resulting in emotional convergence within the team (Hatfield, Cacioppo & Rapson, 1994).

Clapp-Smith et al. (2009) cite contagion concepts as a possible framework to support the notion of collective PsyCap. In particular, they purported that contagion processes may exist beyond variables analyzed at the individual-level in explaining the relationship between authentic leadership and followers' collective PsyCap. We extend this line of thinking by suggesting that cognitive (social) contagion theory could provide theoretical support for a collective PsyCap construct. As discussed earlier, a collective provides a social context in which members can discuss and exchange their beliefs and cognitions regarding the team's capacity to perform certain tasks or accomplish set goals. Thus, when individual members communicate about the team with a greater sense of efficacy ("*I really believe our team can do this*"), optimism *("I think good outcomes will be reached for our team"*), hope ("*There are several ways our team can achieve this goal*"), resilience ("*We've had a setback, but we've learnt from it and can do better next time*") they exchange perceptions regarding the team's capacities, which may contribute to a shared sense of PsyCap.

Although emotional contagion theory has not specifically been cited in relation to the emergence of collective PsyCap, we suggest that the contextual and personal variables relevant to emotional contagion could be applied to the emergence of collective PsyCap. For example, if a team member physically expresses emotions congruent with positive PsyCap (e.g. expressions of engagement, determination) other team members may mimicry these expressions and subsequently 'catch' the

emotion through processes of afferent feedback; thus resulting in a collective expression of positive PsyCap. West et al. (2009) reported that length of time served as a team was a significant factor in predicting levels of collective psychological capacities, including resilience, efficacy and optimism. This is consistent with research regarding emotional convergence within teams, whereby team tenure is positively related to team emotional convergence (Totterdell, 2000; Totterdell et al., 1998).

In reviewing the extant collective PsyCap literature (Table 5-1), it is apparent that there remains scope for further development and refinement regarding the theoretical frameworks to support the notion of collective PsyCap. However, it is evident at this early stage of theory development that a critical point of commonality exists within the literature – specifically, the role of social exchange and interaction in the formation of *shared* group perceptions regarding collective PsyCap.

5.6 Developing Multilevel PsyCap Theory

Kozlowski and Klein's (2000) framework for multilevel theory development centers on a series of principles relating to the *what, how, when, where and why* of theory advancement. According to the first principle, a multilevel theory must, in the first instance define the construct of interest (the '*what*'). This definition will then drive the levels, constructs and linking processes to be addressed in the multilevel theory. Second, the theoretical framework must explain *how* phenomena at different levels are linked, whether that is through top down processes, or bottom up processes, or a combination of both. Closely related to the principle of *how* levels are related, is the principle of *where* – that is, *where* exactly is the level of unit of interest (i.e. team, department or organization). The '*when'* principle relates to the potential influence of time on the processes which form the construct of interest. Finally, the

why (and equally important *why not*) relates to explaining the assumptions that underlie the multilevel model.

If we consider these principles in relation to collective PsyCap research to date, it is evident that some efforts have been made to define the construct of collective PsyCap (the *'what'*) and the '*how*' of team PsyCap. However, enormous opportunities remain to develop the theory in relation to the *where, when and why* (or *why not*). To this end, we suggest a broadening of current conceptualizations of collective PsyCap, so to consider alternate definitions or 'forms' that will allow for a more comprehensive understanding of PsyCap at higher levels. Additionally, by considering alternate forms of collective PsyCap we are also able to begin to address the '*how, where, when and why'* of multilevel PsyCap theory. We also suggest consideration for conceptualizations of collective PsyCap which are not solely reliant on *sharedness* within the group regarding PsyCap perceptions are needed. It is argued that by exclusively conceptualizing and operationalizing constructs as dependent on ample within group agreement runs the risk of oversimplifying group-level phenomena (Cole, Bedeian, Hirschfeld & Vogel, 2011). Thus, we will now review alternate possibilities for defining, conceptualizing and operationalizing of collective PsyCap (surmised in Table 5-2) in an attempt to further 'build out' our understanding of 'collective' PsyCap and its potential applications within human resource management practice.

Table 5-2

A Summary of Proposed Alternate Forms of Collective PsyCap

Construct	**Definition**	**Measurement**
Summated PsyCap	*The summation of a group of individual's psychological state of development characterized by hope, efficacy, resilience and optimism*	Additive Model
Assimilated PsyCap	*The assimilation of a group of individual's psychological state of development that is characterized by hope, efficacy, resilience and optimism.*	Direct Consensus Model
Team PsyCap	*The team's shared psychological state of development that is characterized by hope, efficacy, resilience and optimism.*	Referent Shift Consensus Model
PsyCap Strength	*The strength of a team's psychological state of development that is characterized by hope, efficacy, resilience and optimism*	Dispersion Model

5.6.1 Matching level of theory with level of measurement

Before examining alternate conceptualizations and operationalizations of collective PsyCap the issue of isomorphism must be considered. *Conceptual isomorphism* specifies whether a construct is operationalized differently at different levels of analysis (Li & Cropazano, 2009). Thus, although the meaning of a construct may be similar across levels, the nomological network for the construct may vary depending on the focal level. For instance, it has been found that efficacious beliefs of individuals (self-efficacy) and of groups (collective efficacy) evolve differently, despite sharing essentially the same meaning (Chen & Bliese, 2002). Conceptual isomorphism is differentiated from *functional isomorphism* which refers to whether a group-level construct predicts the same variables as its individual-level counterparts.

The issue of isomorphism has received minimal consideration in collective PsyCap literature, thereby increasing the likelihood of misalignment between theory and measurement. Subsequently, consideration for both conceptual and functional isomorphism will be integrated into our discussion of alternate conceptualizations of collective PsyCap in an attempt to strengthen the alignment between theory and measurement and further develop the understanding of PsyCap at higher levels.

5.7 Composition models of aggregation

Composition models specify the functional relationship between phenomena at different levels of analysis. Chan's (1998) typology has been a cornerstone in guiding multilevel research in regards to the selection of aggregation methods. According to the typology, there are five methods of aggregation; *additive, direct-consensus, referent-shift consensus, dispersion* and *process compilation*. Given that according to Chan (1998) the process composition model does not have an empirical algorithm, it will not be considered in further detail here. Rather, the following

section will concentrate on the four remaining models and explore how each of these could relate to extant and proposed conceptualizations of PsyCap at the collective level.

5.7.1 Collective PsyCap and the additive model

The additive model represents the most basic form of aggregation, whereby the collective construct is operationalized by the sum of the lower level scores (Li & Cropanzano, 2009). Examples include the summation of individuals' sales figures to represent team sales and the summing of team member tenure to represent team expertise. Thus, variance among lower level units has no operational or theoretical bearing on aggregating the lower level construct to the higher level.

An additive model is considered incongruous with current conceptualizations of collective PsyCap, given that the current definition is dependent on *sharedness* among team members (Peterson & Zhang, 2011; Walumbwa et al., 2011). Accordingly, as evident in Table 5-1, this method of aggregation has not been considered by PsyCap researchers.

However, there may be instances where consideration of an alternate form of collective PsyCap, based upon the additive model of composition, is both necessary and useful. For example, consider *s*wift s*t*arting *a*ction *t*eams (STATs). STATs are defined as teams that a) are comprised by a group of experts who have no experience working with one another; b) perform the team task immediately upon team formation; and c) face high stakes from their inception (McKinney, Barker, Davis & Smith, 2005). Typical examples of STATs include combat teams and aircraft flight crews; however other examples can include project teams, surgical teams, disaster response teams and short-term task forces (Wildman et al., 2012).

STATs have limited opportunity for interactions to allow for the exchange of perceptions regarding the team's capacities, and thus, to develop a *sharedness* regarding these capacities. Despite this, it is likely that similar to other forms of capital (i.e. human capital), the simple summation of individual PsyCap resources may have a positive relationship with team-level outcomes (i.e. performance). Consequently, in the case of STAT teams and other interchangeable teams, it may be necessary to modify the conceptualization of collective PsyCap so not to define the construct as a "*shared* state of psychological development" (Walumbwa et al., 2011). Alternatively, a more appropriate conceptualization of collective PsyCap for newly formed teams, or teams with minimal social interaction (i.e. virtual teams), may relate to the *summation* of a group of individuals' "psychological state of development as characterized by...[hope, self-efficacy, resilience and optimism]" (Luthans, Youssef et al., 2007, p3). This conceptualization is similar to the pooled resources framework of team emotional skills (Bell, 2007; Jordan, Ashkanasy, Härtel & Hooper, 2002).

This alternate form of collective PsyCap, which we term *summated PsyCap*, may also allow for insight into a teams' potential PsyCap prior to teams being formed, as it would be measured independent of emergent team processes. Given this, it is conceivable that *summated PsyCap* could be more strongly related to antecedents derived from individual team members, such as average team age and average team education level, and less strongly related to team characteristics, such as team interdependency. From a practical perspective, *summated PsyCap* could provide useful in guiding managers in team selection, as it would provide a gauge of team compositions which would provide higher degree of positivity.

Proposition 1: Summated PsyCap will have a positive relationship with team performance within newly formed teams, transient teams, and other team structures with minimal social interaction (i.e. STATs; virtual teams).

5.7.2 Collective PsyCap and the direct-consensus model

The direct-consensus model implements within-group consensus of the lower-level units as the functional relationship to specify how the construct at the lower-level is functionally isomorphic to another form of the construct at the higher-level. Typically, a within-group agreement index (e.g. r_{wg}; James, Demaree & Wolf, 1984) of the scores from the lower-level with a certain cut-off value (i.e. .70) is employed to represent within-group consensus, and therefore justify aggregation of the construct to the higher-level. Conversely, when consensus within the unit does not reach the pre-determined cut-off value, it is assumed that there is insufficient agreement among the unit to warrant aggregation to the higher-level.

Two collective PsyCap studies (Clapp-Smith et al., 2009; Peterson & Zhang, 2011) have implemented the direct-consensus aggregation method. However, although significant findings have been reported using the direct-consensus approach, this operationalization appears incongruent with the current definition of collective PsyCap ("the group's *shared* psychological state of development"; Peterson & Zhang, 2011; Walumbwa et al., 2011). It is questionable that the measurement of an individual's perceptions of their *own* psychological capital truly reflects collective PsyCap, regardless of sufficient within-group agreement. Rather, it may simply show that the team members are similar in how they perceive their *own* individual psychological capital. Further question exists as to why we would expect team members to have convergence in relation to the ratings of their own individual psychological capacities. Unlike procedural justice, which is an external experience

which affects everyone in the group, individual-level psychological capital is an internal, subjective state. Thus, it is equally likely that individual team members would in fact vary in relation to how they perceive their *own* individual psychological capacities.

Regardless, it is evident from recent research (Clapp-Smith et al., 2009; Peterson & Zhang, 2011) that similarity within teams regarding individual-referent PsyCap is positively related to team-level outcomes, including performance. As such, we suggest a less ambiguous definition of this form of collective PsyCap is needed which clarifies the level of referent being implemented. Thus, we propose this form of collective PsyCap, which we term *'assimilated PsyCap'*, as the *assimilation* of a group members' individual psychological states of development that is characterized by hope, optimism, resilience and self-efficacy.

Although it is clear that elements of social interaction are imperative for this assimilation of individual-referent PsyCap perceptions to occur, more research is needed to investigate what particular processes are relevant to this assimilation. For example, antecedents such as team size may play an important role in the emergence of *assimilated PsyCap.* Research has demonstrated that larger teams provide reduced opportunity for members to contribute ideas and opinions (Colquitt, Noe & Jackson, 2002). Thus, given that the opportunity for social exchange and the alignment of perceptions is reduced in larger teams, it could be expected that these teams demonstrate a lower level of *assimilated PsyCap*.

Proposition 2: Larger team size will be negatively related to the emergence of assimilated PsyCap.

Similarly, particular styles of leadership may be imperative in the development of PsyCap at the collective level. Authentic leadership is typified by a leader's self-awareness, openness and clarity in their actions (Wang, Sui, Luthans, Wang & Wu, 2014). Authentic leaders focus on fostering follower potential by developing their strengths, including resilience and self-efficacy (Gardner & Schermerhorn, 2004) which in turn, enhances employee performance and functioning. In relation to PsyCap, it has been theorized that authentic leaders draw upon their own positive psychological resources to develop and complement followers' own PsyCap (Luthans & Avolio, 2003). Thus, leaders who encompass authentic-related dimensions, such as the sharing of information, encouraging group decision making processes and promoting open and ethical behaviors are more likely to enhance followers' PsyCap (Avolio & Gardner, 2005; Rego, Sousa, Marques & Cunha, 2012; Walumbwa et al., 2011; Yammarino, Dionne, Schriesheim & Dansereau, 2008).

In addition, particular modes of feedback may increase the emergence of *assimilated PsyCap*. For instance, in circumstances where individual performance is predominately appraised and rewarded on the basis of team performance (e.g. team sales) it is conceivable that individual team members would become aligned in their individual-referent PsyCap perceptions. Campion, Medsker and Higgs (1993) purported the importance of reward and feedback interdependence (i.e. outcome interdependence), by explaining that group-oriented behavior and attitudes will be enhanced when individual feedback and rewards are linked to the overall group performance.

Proposition 3: Authentic leadership and outcome interdependency will be positively related to the emergence of assimilated PsyCap.

Organizational climate may also be an important antecedent in shaping the emergence of *assimilated PsyCap*. Organizational climate is conceptualized as being characterized by a number of dimensions (see Patterson et al., 2005 for detailed review). Examples of climate dimensions include *flexibility* (i.e. the degree to which employees are encouraged to develop new ideas and approaches), *reflexivity* (i.e. the extent to which people reflect on strategies and objectives in relation to wider goals), *effort* (the degree to which employees work towards goals), and *clarity of organizational goals* (the extent to which organizational goals are clearly defined).

These dimensions share commonality with aspects of PsyCap. For instance, Youssef and Luthans (2011) reported that high levels of hope (pathways) promote greater creativity and innovation. As such, we suggest that a bi-directional relationship may exist between *assimilated PsyCap* and organizational climate. For example, teams demonstrating positive *assimilated PsyCap* may be more likely to perceive their organization as more flexible and reflexive, and thus as having a more positive organizational climate. Similarly, organizations that foster greater flexibility, reflexivity, effort and clarity of organizational goals may in turn promote greater positive *assimilated PsyCap* among their work teams.

A supportive organizational climate, in which employees perceive that they receive sufficient support from their colleagues, other departments and their supervisor to successfully perform their work duties, may also provide the necessary conditions for PsyCap to flourish (Gibbs & Cooper, 2011). It is posited that employees who feel they are supported at work are more likely to generate alternate pathways towards goals (hope), bounce back following setbacks (resilience) and implement more optimistic attributions. A positive association between perceived supportive organizational climate and individual employee PsyCap has been

empirically demonstrated (Luthans, Norman, Avolio & Avey, 2008). Thus, we suggest that when a collective of employees similarly perceive their organization as supportive, they are likely to demonstrate positive *assimilated* PsyCap.

Proposition 4: Positive organizational climate will be positively related to the emergence of assimilated PsyCap within teams and other collectives (i.e. units, departments).

Furthermore, based on individual-level (Avey et al., 2011; Luthans, Avolio et al., 2007) and team-level (Clapp-Smith et al., 2009; Peterson & Zhang, 2011) PsyCap research, it is likely *assimilated PsyCap* would have a direct relationship with team performance. This proposition is based on the rationale that teams containing individuals with similarly high levels of individual-referent PsyCap will be similarly engaged in their work and will proactively interact with one another towards the successful completion of team goals. Thus, teams with positive *assimilated PsyCap* would be more motivated, directed and effective at achieving success, which may positively influence both individual- and team-level performance.

Proposition 5: Assimilated PsyCap will be positively related to team-level performance, particularly on tasks where the outcome interdependency among team members is low (e.g. unit sales).

However, what remains ambiguous is the degree to which *assimilated PsyCap* predicts team-level outcomes in comparison to other operationalizations of collective PsyCap, such as the referent-shift model, which will be discussed in the proceeding section. Similarly, it is unclear as to whether there are detrimental effects of having too much similarity of within collectives in relation to PsyCap. Teams comprised of members with equally high individual-referent PsyCap may be at

greater risk of over estimating their abilities, setting unrealistic goals, and ignoring negative consequences of chosen courses of action, than teams with greater variance in individual-referent PsyCap. The pitfalls of extreme positivity have been previously documented (Diener & Biswas-Diener, 2008). Specifically, illusions and self-deceit that arise from hubris and unrealistic optimism can result in misuse of resources and can lead to poorly developed strategies (Youssef & Luthans, 2011). Thus, further investigation is needed for determining an optimal balance of *assimilated PsyCap* within teams and other collectives.

5.7.3 Collective PsyCap and the referent-shift composition model

The referent-shift model shares some procedural similarities with the direct-consensus approach, in so far as justification for aggregation to the higher-level is dependent upon sufficient within-group consensus. However, unlike direct-consensus where the referent of interest is the individual's experience or perceptions (i.e. *"I feel confident…"*), the referent-shift model focuses on the individual's perception of the unit as a whole (i.e. *"My team is confident..."*). This new referent is then combined to represent the higher-level construct providing sufficient within group agreement (Rupp, Bashshur & Liao, 2007).

Chan (1998) suggested that referent-shift composition is important because the change in referent results in a new form of the construct which is conceptually distinct from the original construct. For example, if we consider PsyCap as measured with the referent-shift approach, a team member with high individual-level PsyCap, can have either high or low team-level PsyCap because the two constructs are distinct.

It is because of this distinction that several researchers favor the referent-shift approach over the direct-consensus approach when aggregating constructs (i.e. self-

efficacy to collective efficacy). For instance, it has been suggested that the aggregation of team members' individual self-efficacy scores as a representation of collective efficacy would be flawed, as mean scores would represent individual members' perceptions of themselves as individuals, and not their perceptions regarding the team as a whole (Guzzo, Yost, Campbell & Shea, 1993). Thus, although the referent-shift approach utilizes individual member's responses, because these responses are in relation to the team referent, the approach provides a much closer link between team-level theory and measurement.

To date, PsyCap literature is still relatively void of this critical discussion regarding whether individual PsyCap and collective PsyCap are in fact conceptually and functionally isomorphic or rather distinct constructs. As indicated by Table 5-1, it seems the assumption of conceptual isomorphism has been made in two of the studies, and thus the direct-consensus composition model has been employed (Clapp-Smith et al., 2009; Peterson & Zhang et al., 2011). The remaining study (Walumbwa et al., 2011) appears to have conceptualized collective PsyCap as a distinct and unique construct from individual-level PsyCap and as such, has implemented a referent-shift consensus model to operationalize collective PsyCap.

At this point it is important to reiterate that we do not wish to suggest that there is only one single way to conceptualize and operationalize collective PsyCap. Rather, the critical point to emphasize is that it is essential that the mode of measurement is congruent with the conceptualization of the construct *at each level* of analysis (Chan, 1998). Consequently, our aim has been to explore alternative conceptualizations of PsyCap at the collective PsyCap along with their corresponding model of measurement, in order to guide future collective PsyCap research.

As such, we propose a further form of collective PsyCap, as measured using the referent-shift model (which we will term as *'team PsyCap'* to avoid confusion with the more general term of collective PsyCap). *Team PsyCap* is positioned as conceptually distinct from both individual-level PsyCap and what we have termed *assimilated PsyCap*. For instance, consider the theoretical propositions of collective (team) PsyCap as proposed by Walumbwa et al. (2011). These researchers posit that *team PsyCap* (as measured using referent-shift) can be defined as "the *group's shared* psychological state of development that is characterized by [hope, efficacy, optimism, and resilience]" (Walumbwa et al., 2011, p. 6). Accordingly, a *group's shared belief* is produced through a series of group interactions and the process of collective cognition, and is subsequently distinct from the individual beliefs each team member may hold about themselves or the group. Moreover, this is vastly different from the individual-level conceptualization of PsyCap as an "individual's state of development" characterized by the psychological resources of self-efficacy, hope, optimism, and resilience (Luthans, Youssef et al., 2007, p. 3).

Similar to *assimilated PsyCap*, we postulate that *team PsyCap* may relate to antecedents such as team size, leadership styles (i.e. authentic leadership and transformational leadership) and organizational climate. However, we further suggest that factors such as task interdependency, whereby team members are required to cooperate and work interactively in order to achieve specified tasks, may be particularly important for the emergence of *team PsyCap*. Task interdependency promotes opportunity for communication and collective planning among team members in order to achieve team goals (Gundlach et al., 2006). Thus, we suggest that teams engaged in work involving high task interdependency will have greater opportunity to develop *team PsyCap* as team members would regularly communicate

regarding the team's overall likelihood of achieving set goals (optimism) and their shared belief in achieving specific tasks (efficacy). Additionally, intra-team processes such as flexibility encourage team members to develop multiple pathways to achieve their task (hope) and the capacity to redirect their efforts when faced with setbacks (resilience).

Moreover, given that the conceptualization of *team PsyCap* requires team members to consider the psychological capacities of the overall team, we further suggest that team cohesion would be central to the formation of team PsyCap. Cohesive teams consist of members who are committed to their fellow team members on an interpersonal level and the overall team's tasks (Goodman, Ravlin & Schminke, 1987). Thus, it is probable that members of cohesive teams are more able to identify with the team and therefore, envisage similar assessments of the team in relation to shared psychological capacities (i.e. *team PsyCap*). Conversely, members of teams with low cohesion (and thus, less commitment to the team) may be less able to conceptualize an assessment of team psychological functioning.

Proposition 6: Team-level antecedents such as task interdependency and team cohesion will be related to the emergence of team PsyCap.

Proposition 7: Team PsyCap will be positively related to team-level outcomes such as performance, particularly on tasks where task interdependency among team members is high.

It is also suggested that time and a history of shared outcomes will also be imperative for the emergence of *team PsyCap*. Research has demonstrated that team tenure is related to the degree of within-group consensus regarding team-level psychological capacities (i.e. resilience, efficacy and optimism; West et al., 2009). Specifically, newly formed teams only demonstrated sufficient within-team

agreement on the optimism dimension of PsyCap. However, following the completion of several team-based projects over an extended period of time (i.e. several months) sufficient within-team agreement was achieved on other psychological capacities, including resilience and efficacy (West et al., 2009). Thus, particularly for the development of team-referent efficacy and resilience, a team history of performances and outcomes is required. Consequently, this needs to be considered when assessing *team PsyCap* in newly formed teams and further strengthens our earlier proposition that an alternate form of collective PsyCap (i.e. *summated PsyCap*) may be required depending on team tenure.

Proposition 8: Team tenure will be positively related to the emergence of team PsyCap, as team PsyCap is dependent on teams sharing a history of task and outcome experiences.

Although we have suggested that *team PsyCap* will have direct relationships with team-level outcomes, including performance, there is further potential for *team PsyCap* to have positive cross-level relationships with individual-level outcomes, such as job satisfaction and organizational commitment. We propose that members of teams who share high motivational propensity to work towards their stated goals and who are able to 'bounce back' when faced with challenges are more likely to be satisfied with their job, than members of teams who share low confidence regarding their team's ability and who lose direction when faced with adversity. Consequently, members of teams with higher *team PsyCap* are conceivably more likely to be committed to the job, and more broadly their organization.

Proposition 9: Team PsyCap will have positive cross-level relationships with individual-level outcomes including job satisfaction and job commitment.

5.7.4 Collective PsyCap and the dispersion model

Despite the wide use of consensus aggregation models (i.e. direct-consensus and referent-shift) in multilevel research, several limitations of these models have been noted. It has been argued that by implementing an average of lower-level scores to represent group-level phenomena, the true distribution of underlying scores is overlooked (Lindell & Brandt, 2000). Consequently, potentially meaningful variation in team members' responses may be ignored. Furthermore, consensus-based models assume group members will perceive and understand a construct in a similar manner (Mathieu, Maynard, Rapp & Gilson, 2008) and that only groups with high agreement (thus low dispersion) are appropriate for multilevel research. As such, a bias occurs whereby research employing these methods only relates to groups or teams with elevated agreement (Cole et al., 2011). It has therefore been suggested that consensus models run the risk of over-simplifying group level phenomena, resulting in biased and equivocal findings (Colquitt et al., 2002).

Given these criticisms and limitations, it has also been suggested that approaches that focus on the *variance* of group members' responses may strengthen multilevel findings and offer more complete understandings into group-level phenomena (Cole et al., 2011). The dispersion model postulates that the degree to which team members share (or do not share) the same opinion is more than a statistical requirement for aggregation and that dispersion of scores is a construct in its own right (Li & Cropanzano, 2009). Thus, providing there is ample composition theory, the degree of agreement or disagreement within the team on a particular measure can become the focal construct. As such, within group variance is no longer treated as error variance, but rather as the operationalization of the focal construct.

Although other areas of organizational behavior research have implemented this method of composition (i.e. justice climate strength; Naumann & Bennett, 2000; Roberson, 2006) to date the dispersion model has not been applied to PsyCap research. However, in considering the premise of dispersion modeling, it is suggested that there is further scope to investigate the application of this model to PsyCap multilevel research. Subsequently, we propose an extended conceptualization of collective PsyCap so to consider *PsyCap Strength* which refers to the degree of consensus between team members regarding the team's psychological state development that is characterized by hope, efficacy, resilience and optimism.

Based on contagion theories previously reviewed, it is suggested that *PsyCap Strength* may have a differential relationship with team-level outcomes, depending on the level of *team PsyCap* (i.e. higher or lower). For instance, teams with both high *team PsyCap* level and *PsyCap Strength* could be expected to demonstrate sustained optimal team performance over time – as team members' positivity will influence each other and buoy their performance. Conversely, teams with low *team PsyCap* level, but high *PsyCap Strength* could be expected to exhibit poorer performance over time, as the negativity within the team will be maintained by the shared perceptions within the team regarding the team's capabilities.

Proposition 10: Interactive relationships between Team PsyCap level and PsyCap Strength will predict team-level outcomes across time.

It is also suggested that exploration of collective PsyCap using the dispersion model could provide further depth to multilevel PsyCap theory – specifically in relation to the *'how, where* and *when'* of multilevel theory development (Kozlowski & Klein, 2000). As discussed previously, the role of social exchange and interaction is central to the formation of shared group perceptions. Therefore, factors such as

team tenure and interdependency may play a role in the development of *PsyCap Strength*, as these teams have greater opportunity to share and exchange beliefs regarding the team's capacities and become homogenous in their perceptions of team PsyCap.

Proposition 11: Team-level antecedents, such as team tenure, interdependency and cohesion will be positively related to PsyCap Strength.

5.8 Implications of the multilevel-multireferent PsyCap framework

By proposing an extension of the current multilevel PsyCap framework so to consider both level and referent of analysis, we make several valuable and unique contributions to collective PsyCap literature. First, the framework fosters greater alignment between theory, conceptualization and operationalization of PsyCap at higher levels, by introducing alternate forms of PsyCap. Moreover, the development of alternate forms of PsyCap (i.e. *summated PsyCap, assimilated PsyCap, team PsyCap* and *PsyCap Strength*) provides preliminary terminology which reduces the ambiguity and inaccurate interchangeability of terms in relation to the aggregation of PsyCap to higher levels.

Second, by developing a multilevel-multireferent framework we have been able to incorporate findings from related team-level research in order to tease out potential antecedence of each of the proposed forms of collective PsyCap. Subsequently, we have been able to make some initial propositions that begin to address Kozlowski and Klein (2000) principles for multilevel theory development.

Third, the development of a multilevel-multireferent framework has allowed us to suggest how alternate forms of collective PsyCap may relate to various individual-level, team-level and organizational-level outcomes. Thus, by conceptualizing alternative forms of PsyCap at the higher-level, we have been able to

explore in greater depth the potential utility of collective PsyCap. This could hold important implications for team managers and organizational leaders in terms of developing and maximizing the potential of their teams.

It is important to recognize that we present the multilevel-multireferent framework of collective PsyCap and related research propositions as an initial foundation for collective PsyCap theory and research. As such, we do not view the framework as an endpoint, but rather as an evolving multilevel model which will hopefully serve to stimulate and guide future research.

In particular, we acknowledge that although each proposition has developed from related team-level research, empirical research is needed to substantiate each of these. Similarly, although we have proposed alternate forms of PsyCap at the collective level, research aimed at investigating the validity of each of these is also needed. Discriminant validity between each of the proposed forms of collective PsyCap needs to be established in the first instance in order to demonstrate the utility of each form. Similarly, discriminant validity between *assimilated PsyCap* and *team PsyCap* and seemingly similar constructs such as climate and collective efficacy also needs to be established. However, we believe that by mapping out potential formations of collective PsyCap, we are better positioned to commence this work and develop a greater understanding of how PsyCap may emerge and operate at higher-levels.

5.9 Conclusion

This paper provided a review of extant collective PsyCap theory and research. Although the notion of collective PsyCap is a promising area of study, we have argued that further theory development is required in order to progress and expand the utility of PsyCap at higher-levels of analysis. Consequently, we have

developed a multilevel-multireferent framework to introduce the possibility of several forms of collective PsyCap. This framework offers a unique contribution to collective PsyCap literature as it identifies potential antecedents and emergence processes related to the development of various forms of collective PsyCap. Moreover, we have developed a series of testable research propositions which we hope will serve to stimulate and guide future multilevel PsyCap research and enhance the application of collective PsyCap within human resource management practice.

5.10 Post Script

This chapter has provided a theoretical analysis of collective PsyCap as it has been studied in the extant literature. It showed that although emerging research has provided initial empirical support for the notion of collective PsyCap, studies have been divergent in the conceptualization and measurement of collective PsyCap. Consequently, the chapter integrated alternative bodies of theory and corresponding operationalizations of collective PsyCap to develop a multilevel-multireferent framework of collective PsyCap. Four distinct forms of collective PsyCap have been proposed, each grounded in relevant theory and reflecting different modes of operationalization and measurement.

In the following chapter data derived from 43 work teams is used to empirically investigate the viability of different compositional approaches in a cross-level model of team PsyCap and individual and team functioning.

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Chapter 6: The sum is stronger than the parts? Comparing compositional approaches in a cross-level model of team psychological capital and individual and team functioning.

6.1 Preface

The previous chapter presented a theoretical analysis of emerging collective PsyCap literature. A multilevel-multireferent framework was developed in order to foster greater alignment between theory, conceptualization and operationalization of PsyCap at higher levels, introducing alternate forms of PsyCap, including team PsyCap and PsyCap strength.

The study in this chapter adopts a multilevel approach to examine relationships between team PsyCap and team-level outcomes of performance, satisfaction and conflict; and individual-level outcomes of job satisfaction and turnover intent. Additionally, the study compares two composition models of aggregation (direct-consensus and referent-shift) to represent the construct of team PsyCap and examines the notion of team PsyCap strength to explore the degree to which team consensus regarding perceptions of team PsyCap may moderate these relationships. Thus, this chapter contributes to team-level PsyCap theory development and provides clarification regarding the operationalization and measurement of team PsyCap in in-situ work teams.

At the time of submission of this thesis, the contents of this chapter were included in a manuscript under review with *Small Group Research.*

6.2 Introduction

Psychological Capital (PsyCap) is defined as an "individual's positive psychological state of development," characterized by the psychological resources of hope, self-efficacy, resilience and optimism (Luthans, Youssef & Avolio, 2007, p. 3). Recent meta-analytic evidence suggests it is an important predictor of job performance and satisfaction, organizational commitment, organizational citizenship behaviors (OCBs), turnover intentions and psychological well-being (Avey, Reichard, Luthans & Mharte, 2011).

Although PsyCap has mainly been examined at the individual-level, team-level PsyCap, a collective version of the construct, has demonstrated positive associations with team performance (i.e. Clapp-Smith, Vogelgesang & Avey, 2009; Peterson & Zhang, 2011; Walumbwa, Luthans, Avey & Oke, 2011) and team OCBs (Walumbwa et al., 2011). In order to advance emerging multi-level PsyCap literature, this study aims to examine cross-level influences of team PsyCap on both team- and individual-level outcomes. Thus, we extend current team-level PsyCap research by investigating how collective PsyCap may relate to outcomes relevant to employee functioning and well-being, including job satisfaction, turnover intent and team conflict. Additionally, in line with recent calls to examine and articulate adequate composition models that fully specify the functional relationships among focal constructs in multilevel research (i.e. Cole, Bedeian, Hirschfeld & Vogel, 2011) we also investigate the viability of different compositional models for operationalizing team PsyCap.

6.2.1 Individual-Level PsyCap

PsyCap is theorized as a determinant of motivation and propensity to accomplish goals and succeed in the workplace (Peterson & Zhang, 2011).

Accordingly, research has consistently demonstrated that PsyCap is positively related to a variety of employee attitudes and behaviors, including job performance, job satisfaction, organizational commitment and employee well-being, and negatively related to absenteeism, cynicism and turnover intentions (Avey et al., 2011).

The primary explanation for these relationships is that employees with higher PsyCap tend to expect good things to happen to them at work (optimism); believe they can create their own success (hope and self-efficacy); and are persistent in the face of challenges (resilience) when compared with employees with lower PsyCap (Avey et al., 2011). Thus, given the expectations for success and belief in one's ability to achieve success, those with higher PsyCap are more likely to be satisfied with their job (Cheung, Tang & Tang, 2011; Luthans, Avolio, Avey & Norman, 2007), and therefore less likely to harbor turnover intentions (Avey, Hughes, Norman & Luthans, 2008; Avey, Luthans & Youssef, 2010).

Additionally, PsyCap has been positioned as a positive resource in terms of promoting employee well-being. Negative relationships between PsyCap and stress and anxiety have been reported (Avey, Luthans & Jensen, 2009), as have positive relationships between PsyCap and employee well-being (Avey, Luthans, Smith & Palmer, 2010; Luthans, Youssef, Sweetman & Harms, 2013). According to Bakker and Demerouti (2007), job demands can lead to psychological distress among employees, making them susceptible to burnout, anxiety, and impaired health. However, positive psychological resources, including PsyCap, may counteract the distress resulting from job demands, acting as a suppressor or modifier of processes that lead to distress and anxiety (Avey et al., 2011). Moreover, the absence of positive psychological resources can form a substantial risk factor for depression (Woods & Joseph, 2010).

6.2.2 Team-Level PsyCap: Theoretical Foundations

In addition to individual-level PsyCap, it has been assumed that PsyCap can also be experienced on the level of teams (Clapp-Smith et al., 2009; Petersen & Zhang, 2011; Walumbwa et al., 2011). A comprehensive examination of the theoretical conceptualization of team PsyCap has already been detailed (Dawkins, Martin, Scott & Sanderson, *under review*) and as such, an abridged synopsis of these theoretical foundations will be provided here.

Team PsyCap draws on the individual-level definition of PsyCap and defines it as a group's shared psychological state characterized by efficacy, hope, optimism and resilience (Walumbwa et al., 2011). Similar to other team-level constructs, such as collective efficacy, collective PsyCap refers to aggregation from the individual to the team-level (Petersen & Zhang, 2011; Walumbwa et al., 2011). Walumbwa et al. (2011) suggested that collective PsyCap shares similar interactive and dynamic formation processes as collective efficacy (Bandura, 1997). According to this reasoning, the social interaction and synergistic processes inherent to teams are critical for the emergence of team-level PsyCap.

Similarly, Clapp-Smith et al. (2009) proposed that collective PsyCap emerges through 'contagion' processes within a group. Accordingly, an individual's positive emotions and behaviors may elicit positive emotions and behaviors within other group members, creating a dynamic, spiraling process which may contribute to the formation of positive affective homogeneity (Fredrickson, 2003). It has also been suggested that team-level psychological capacities (i.e. team-level efficacy) can be considered isomorphic representations of individual-level psychological capacities (i.e. individual-level efficacy; West, Patera & Carsten, 2009). Thus, it is plausible to

consider both individual- and team-level representations of a single positive psychological capacity (see Kozlowski & Klein, 2000).

6.2.3 Measurement of Collective PsyCap & Relationships with Team-Level Outcomes

Measurement of team PsyCap has been mainly operationalized in two ways; a direct-consensus approach which aggregates individual PsyCap to the team-level (Clapp-Smith et al., 2009; Peterson & Zhang. 2011), and a referent-shift approach (Walumbwa et al., 2011), in which the referent of the PsyCap items is modified to the individual's perception of the team as a whole. Both methods require sufficient within-group agreement to be established prior to aggregation (Chan, 1998).

Both compositional measurement approaches have demonstrated associations between team PsyCap and team performance outcomes. Petersen and Zhang (2011) found that team PsyCap was positively related to business unit performance. Clapp-Smith et al. (2009) reported that team-level PsyCap predicted team sales performance. Walumbwa et al. (2011) also observed a significant relationship between team-level PsyCap and team performance as well as team OCBs.

Although both the direct-consensus and referent-shift measurement approaches have demonstrated positive associations between team-level PsyCap and team-level outcomes, arguably two distinct constructs are being measured using these approaches. Mischel and Northcraft (1997) suggested that the cognition of "can *we* do this task?" (referent-shift consensus) is different from the cognition of "can *I* do this task?" (direct-consensus). Chan (1998) further suggested that referent-shift composition is important because it results in a new form of the construct which is conceptually distinct from the original construct. For example, it has been suggested that the aggregation of team members' individual self-efficacy scores as a

representation of collective efficacy would be flawed, as mean scores would represent individual members' perceptions of themselves, and not their perceptions regarding the team as a whole (Guzzo, Yost, Campbell & Shea, 1993). To date, PsyCap literature is void of examination as to whether aggregated individual-referent PsyCap and team-referent PsyCap are in fact conceptually and functionally isomorphic or rather distinct constructs. Thus, we aim to explore whether either approach to the measurement of team-level PsyCap has unique relationships with adaptive outcomes.

6.2.4 Cross-Level Relationships: Team PsyCap and Individual-Level Outcomes

There is good evidence of significant relationships between individual PsyCap and job satisfaction and turnover intent (Avey et al., 2011). However, as yet no research has been conducted regarding the cross-level relationships between team-level PsyCap and individual-level outcomes, such as job satisfaction and turnover intentions.

Cross-level analysis means examining how higher-level variables influence lower level relationships or outcomes (Bliese & Jex, 2002). Top-down cross-level models have been used widely in organizational research (Jex & Bliese, 1999; Mossholder, Bennett & Martin, 1998; Troth, Jordan, Lawrence, & Tse, 2012).

Team PsyCap may influence individual-level outcomes particularly via the social context of the team. Given that individuals are embedded in social relations at work, individuals within a team may be influenced by the shared capacities of the team (West et al., 2009). According to social information processing perspective (Salancik & Pfeffer, 1978) an important source of information for effective team member behavior and attitudes comes from the immediate work environment. Thus, we suggest that belonging to a team with high positivity (i.e. high team PsyCap) will

have a positive bearing on individual employees' job-related well-being in terms of heightened job satisfaction and lower turnover intentions. This proposition is further supported by social exchange theory (Blau, 1964) and Fredrickson's (2003) upward spiral of positive emotions theory, which postulates that people's behaviors and attitudes are influenced by *how* and *who* they interact with.

6.2.5 Team-Level PsyCap Strength

Following current recommendations, team PsyCap research has aggregated individual-level data only once acceptable within-group agreement is demonstrated (i.e. r_{wg}; James, Demaree & Wolfe, 1993). Within-group agreement has been considered a crucial prerequisite for aggregation (Meade & Eby, 2007). However, several scholars have highlighted shortcomings of this approach, including failure to consider potentially meaningful variation in team member responses (Lindell & Brandt, 2000); assuming that all team members perceive and understand a construct in a similar manner (Mathieu, Maynard, Rapp & Gilson, 2008) and assuming that only groups with high agreement (thus low dispersion) are appropriate for multilevel research (Cole et al., 2011). Subsequently, it has been suggested that consensus models run the risk of over-simplifying group-level phenomena, resulting in potentially biased and equivocal findings (Colquitt, Noe & Jackson, 2002).

Thus, approaches that focus on the *variance* of group members' responses may actually strengthen multilevel findings and offer more complete understandings into group-level phenomena (Cole et al., 2011). This approach (*dispersion modeling*) differs from consensus models in that it postulates that the degree to which team members share (or do not share) the same opinion is more than a statistical requirement for aggregation and that dispersion of scores is a construct in its own right (Li & Cropanzano, 2009). It is suggested that by expanding the research focus

from solely considering members' average response the consensus of a higher-level construct allows for further meaningful increments in the prediction of outcomes (Lindell & Brandt, 2000). For example, research has demonstrated that climate strength moderates the relationship between justice climate level and team-level outcomes, so that climate level is more strongly related to outcome measures in teams with high climate strength (Colquitt et al., 2002).

To date dispersion modeling has not been applied to team PsyCap research. Based on findings from the justice climate literature (Colquitt et al., 2002), it could be expected that team PsyCap level may have a different relationship with team performance, depending on team PsyCap *strength* (i.e. the degree to which team members are similar, or otherwise, in regards to their team level PsyCap perceptions). Thus, teams with both high team PsyCap level and strength could be expected to demonstrate sustained optimal team performance, as team members' PsyCap will influence each other and this will buoy their performance. Conversely, teams with low team PsyCap level and high team PsyCap strength (therefore strong agreement about the team's low PsyCap) could be expected to exhibit poorer performance, as the negativity within the team will be maintained by the shared perceptions within the team regarding the team's capabilities.

6.3 The Current Study

A preliminary aim of this study was to affirm previous research findings (e.g. Avey et al., 2010; Cheung et al., 2011) by demonstrating significant associations between employee PsyCap and employee job satisfaction and turnover intentions. Accordingly, we hypothesized:

Hypothesis 1: Individual-level PsyCap will be positively related to individual-level job satisfaction and negatively related to individual-level turnover intent.

The multilevel design of this study also enabled us to examine possible cross-level effects of team-level PsyCap on individual-level outcomes. This is a new line of inquiry for PsyCap research. However, based on the social information processing perspective (Salancik & Pfeffer, 1978) and the upward spiral of positive emotions theory (Fredrickson, 2003) which posits that the social context of a team can shape individual perceptions and behaviors, we expected team-level PsyCap would have significant cross-level influence on individual employee attitudes, regardless of method of operationalization of team PsyCap. As such, we proposed:

Hypothesis 2: Both direct-consensus and referent-shift team PsyCap will be positively related to individual-level job satisfaction.

Hypothesis 3: Both direct-consensus and referent-shift team PsyCap will be negatively related to individual-level turnover intent.

This study was also concerned with demonstrating relationships between team PsyCap and team-level outcomes. Given that team-level PsyCap has been positively associated with team performance when operationalized with both the direct-consensus (Clapp-Smith et al., 2009; Peterson & Zhang, 2011) and referent-shift (Walumbwa et al., 2011) models of aggregation, we hypothesized:

Hypothesis 4: Both direct-consensus and referent-shift team PsyCap will be positively related to team performance.

Although elements of team PsyCap (i.e. resilience, efficacy and optimism) have been found to positively relate to team satisfaction and negatively relate to team conflict (West et al., 2009), such relationships are yet to be demonstrated with team

PsyCap in its entirety. However, it is suggested that team-level PsyCap can influence team satisfaction, in that members of teams with higher PsyCap are more actively engaged in their work and proactively interact with each other towards successful completion of tasks, thereby increasing team satisfaction. Moreover, based on previous research examining team-level positivity (i.e. team-level resilience, efficacy and optimism; West et al., 2009) we theorize that overall team-level PsyCap may provide a buffer to both team and task conflict. Specifically, teams with positive (higher) team PsyCap will perceive conflict as a resolvable challenge which can be overcome with renewed dynamism to work towards team goals. Team-level PsyCap may also prevent team members from internalizing and personalizing potential relationship conflicts, thus lessening the experience of extended relationship conflict within teams with higher team PsyCap. Therefore, we predicted:

> *Hypothesis 5:* Both direct-consensus and referent-shift team PsyCap will be positively related to team satisfaction.
>
> *Hypothesis 6:* Both direct-consensus and referent-shift team PsyCap will be negatively related to team task and team relationship conflict.

Finally, this study aimed to extend current team-level PsyCap literature by investigating what we termed PsyCap strength in relation to the individual- and team-level outcomes using dispersion modeling. Other higher-level literatures, such as justice climate, have demonstrated that climate strength moderates the relationship between justice climate level and team performance and absenteeism, so that climate level is more strongly related to the outcome measure in teams with high climate strength (Colquitt et al., 2002). However, given the exploratory nature of this research direction, specific hypothesis were not stated. Rather, we positioned the

following research questions to be examined in relation to both operationalizations of team PsyCap:

> *Research Question 1:* Does team PsyCap strength explain significant variance beyond that explained by team PsyCap level in the prediction of individual-level (job satisfaction and turnover intent) and team-level (team performance, satisfaction and conflict) outcomes?
>
> *Research Question 2:* Does team PsyCap strength moderate the association between team PsyCap level and each of the individual-level (job satisfaction and turnover intent) and team-level (team performance, satisfaction and conflict) outcomes?

6.4 Method

6.4.1 Sample and Procedure

Employee data was collected from 10 organizations including government and non-government organizations, private sector companies and smaller private enterprises, representing energy and resources, employment and recruitment, financial services, counseling, and child care. Five organizations represented private sector companies, four of which employed over 200 employees. The remaining private organization employed between 20-199 employees. Three other organizations represented state government departments (each employing over 200 employees), while another organization represented local government on a municipality level (employing 19-200 employees). One further organization was a non-government organization with 19-200 employees.

Complete data was collected from 193 employees, representing 43 teams (average team size = 4.48) with a response rate of 50.3%. Among the respondents, 60.6% were female and 96.4% indicated that English was their first language. The

majority of respondents were aged between 40-49 (28.5%), while the remainder was aged 18-29 (24.9%), 30-39 (21.8%), 50-59 (17.6%) and 60 years or older (7.3%). Around half (52.3%) of respondents had completed a university degree, 20.7% had completed a diploma, 8.3% had completed senior high school, 10.4% had completed high school (up to grade 10) and 8.3% had completed some other form of educational qualification. The majority of respondents were employed on a full-time basis (67.9%) and in permanent positions (90.2%). Most respondents had organizational tenure greater than five years (35.8%), with a further 28% having a tenure time of 3-5 years, and 23.3% between 1-2 years. Only 13% of respondents reported organizational tenure of less than 12 months.

Surveys were conducted online. An information letter was emailed to employees via the organizations' human resources manager explaining the aims of the research and requirements for participation. A direct link to the secure online survey was included in the information letter. A copy of the survey is included in Appendix B. Participation was voluntary and informed consent obtained.

Employees were automatically assigned an identifying code, which linked them with their organization once they logged into the online survey. Employees were required to provide their allocated team name so that members of each team could be identifiable to the researchers. Participants completed demographic questions before the employee-focused questionnaires; participants then completed the team-focused surveys.

6.4.2 Measures

Demographic Information

The survey assessed age, sex, organizational tenure, job role and education level, as well as team name, team tenure and team size.

Individual-Level Measures

PsyCap at the individual-level was assessed with the 24-item instrument (Psychological Capital Questionnaire; Luthans, Youssef & Avolio, 2007). Permission to use the PCQ was obtained through the www.mindgarden.com permissions process. The scale includes six items for each of the four components of PsyCap (self-efficacy, hope, optimism and resilience). Example items include: *"I feel confident helping to set targets/goals in my work area"* (self-efficacy); *"If I should find myself in a jam at work, I could think of many ways to get out of it"* (hope); *"When I have a setback at work, I have trouble recovering from it and moving on"* (reversed; resilience); and *"When things are uncertain for me at work I usually expect the best"* (optimism). Each item is rated using a 6-point Likert scale (1=strongly disagree, 6=strongly agree). Reliability for this scale was good (α = .92).

Job Satisfaction was assessed using a 3-item scale by Warr, Cook & Wall (1979). Responses are on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Reliability for this scale was found to be acceptable (α = .84)

Turnover Intentions were measured using four items adapted from Fried & Tiegs (1995) and Meyer, Allen & Smith (1993). Example items include, *"I am planning to search for a new job during the next 12 months"* and *"I often seriously think about resigning from my job"*. Responses are provided on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). Reliability for this measure was good (α = .90).

Team-Level Measures

Direct-Consensus Team PsyCap: Individual-referent PsyCap measures from team members were averaged across teams to measure team-level PsyCap using the direct-consensus model of aggregation (Chan, 1998).

Referent-Shift Team PsyCap was assessed using items from the 24-item PCQ (Luthans, Youssef et al., 2007) adapted with a team referent instead of an individual referent (Chan, 1998). Example items include: *"My team is confident setting targets/goals in our work area"* (efficacy); *"My team always looks on the bright side of things regarding our work"* (optimism); *"If my team gets in a jam at work, we can think of many ways to get out of it"* (hope); and *"My team usually manages difficulties one way or another at work"* (resiliency). Responses were given on the same 6-point Likert scale, ranging from strongly disagree to strongly agree. Reliability for this measure was good ($\alpha = .94$).

Team PsyCap Strength: Team PsyCap strength was measured using the within-group agreement index, r_{wg} (James et al., 1984). The range of within-group agreement across the teams in this sample for direct-consensus team PsyCap was $r_{wg} = .94 - 1.00$ and $r_{wg} = .96 - 1.00$ for referent-shift team PsyCap.

Team Performance & Satisfaction: Employee rated perceived team performance and satisfaction was assessed using 11 items from the Team Performance Scale (Hirst, 1999), for example *"The work my team has been completing has met the required standard"*. Responses were given on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). Reliability for both scales was good (team performance $\alpha = .78$; team satisfaction $\alpha = .89$).

Team Conflict: Team conflict was measured using an 8-item scale by Jehn (1995). Four of these items measure interpersonal conflict within teams (e.g. *"How much friction is there among members of your team?"*); with the other items assessing degrees of task-related conflict within teams (e.g. *"How much conflict about the work you do is there in your work team?"*). Responses were given on a 5-point

Likert scale, ranging from 1 (none) to 5 (a lot). Reliabilities for team relationship conflict (α = .93) and task conflict (α = .77) were acceptable.

6.4.3 Levels of Analysis

To assess the appropriateness of aggregating PsyCap scores to the team-level, we examined both between-team and within-team agreement. We used two intraclass correlations (ICCs) for assessing agreement among team members. The ICC_1 indicates level of agreement from members in the same team, while the ICC_2 suggests whether teams can be differentiated on the variables under investigation. For direct-consensus team PsyCap, the ICC_1 was .32 and the ICC_2 was .79; while for referent-shift team PsyCap the ICC_1 was .23 and the ICC_2 was .71. The F-values for ANOVA tests were also significant for both direct-consensus team PsyCap ($F(42, 150) = 1.50$, $p < .05$) and referent-shift team PsyCap ($F(42, 149) = 2.04$, $p < .01$). The r_{wg} average value was .98 for direct-consensus team PsyCap and .99 for referent-shift team PsyCap. Thus, both r_{wg} values exceeded the recommended minimum cutoff value of .70 (James et al., 1984).

We used hierarchical linear modeling (HLM; Raudenbush, Bryk, Cheong & Congdon, 2004) to test our individual-level and cross-level hypotheses. Hierarchical regression analysis was employed to test team-level hypotheses.

6.5 Results

Table 6-1 presents the means, standard deviations and correlations between the variables of interest. Following Mathieu and Taylor (2007) we first ran a series of null models (i.e. no individual-level or team-level predictors) in order to examine the ratio of within-team to between-team variability in individual level job satisfaction and turnover intent (ICC). These revealed non-ignorable ICCs for individual-level job satisfaction (ρ = .05) and turnover intent (ρ = .07; Snijders & Bosker, 1999).

Table 6-1

Means, Standard Deviations and Correlations among the Study Variables

Variable	*M*	SD	1	2	3	4	5	6	7	8	9
1. Individual PsyCap	4.64	0.55	(.92)								
2. Job Satisfaction	12.40	2.20	.43**	(.84)							
3. Turnover Intent	10.40	6.00	-.35**	-.60**	(.90)						
4. DC Team PsyCap	4.64	0.30	.02	.09	-.17	(.92)					
5. RS Team PsyCap	4.70	0.40	-.17	-.01	-.01	.62**	(.94)				
6. Team Performance	20.00	1.80	-.03	.06	-.16	.46**	.71**	(.78)			
7. Team Satisfaction	23.15	2.27	-.10	-.18	.14	.42**	.70**	.56**	(.89)		
8. Team Task Conflict	7.30	1.14	.02	-.10	.14	-.03	-.23	-.33*	-.20	(.77)	
9. Team R'ship Conflict	8.40	1.90	.01	-.002	.08	-.21	.37*	-.33*	-.42**	.68**	(.93)

Note Variables 1 to 3 are computed at the individual-level using n = 193. Variables 4 to 9 are computed at the team level using n = 43 teams. Coefficient alphas appear in parentheses along the diagonal
DC., Direct-Consensus; RS., Referent-Shift
*p <.05, **p<.01

6.5.1 Individual-level relationships

We predicted that individual-level PsyCap would be positively related to employee job satisfaction. Model 1 in Table 6-2 shows that job satisfaction is predicted by individual-level PsyCap ($\boldsymbol{\beta}$ = 1.72, $p < .01$). We subsequently tested increasingly complex models; random intercepts (Model 2) and random slopes (Model 3). The significant residual variance of the intercepts in Model 2 indicates that there is substantial variation between level-2 units (i.e. teams). The non-significant residual variance of the slopes however indicates that there is no significant variation between teams in how PsyCap predicts job satisfaction. Moreover, deviance tests between Model 2 and Model 3 suggested that the more complex model did not fit the data significantly better than the random intercepts model ($\Delta_{Deviance}$ = .29, *df* = 2, *n.s.*).

Conversely, we posited that individual-level PsyCap would be negatively related to employee turnover intent. Model 1 in Table 6-3 shows that turnover intent is predicted by individual-level PsyCap ($\boldsymbol{\beta}$ = -3.17, $p < .01$). Following the same procedure as for job satisfaction, we found significant residual variance of the intercepts in Model 2 which indicate that there is substantial variation between level-2 units (i.e. teams). There was no significant residual variance of the slopes indicating no significant variation between teams in the slopes of PsyCap predicting turnover intent, which is also supported by non-significant deviance tests between Model 2 and Model 3, suggesting that the more complex model did not fit the data significantly better ($\Delta_{Deviance}$ = 4.57, *df* = 2, *n.s.*).

Table 6-2

Fixed Effect Estimates and Random Effect Estimates for Predicting Individual-Level Job Satisfaction from Individual-Level PsyCap

	Fixed effects		
Parameter	Model 1	Model 2	Model 3
Intercept	.37** (0.20)	12.35** (0.20)	12.35** (0.20)
Level 1			
Individual PsyCap		1.72** (0.31)	1.74** (0.31)
	Random effects		
Residual Variance Intercept	.25 (.50)	.42* (0.65)	.45* (.67)
Residual Variance Slope			.06 (.25)
Deviance	851.35	821.08	820.79

Note Standard errors are in parentheses.

* $p < .05$. ** $p < .01$.

Table 6-3

Fixed Effect Estimates and Random Effect Estimates for Predicting Individual-Level Turnover Intent from Individual-Level PsyCap

	Fixed effects		
Parameter	Model 1	Model 2	Model 3
Intercept	10.36** (.50)	10.35** (.50)	10.36** (.50)
Level 1			
Individual PsyCap		-3.17** (.87)	-3.11** (1.11)
	Random effects		
Residual Variance Intercept	2.72 (1.65)	3.40* (1.84)	4.01** (2.00)
Residual Variance Slope			13.13 (3.62)
Deviance	1234.88	1218.62	1214.05

Note Standard errors are in parentheses. * $p < .05$. ** $p < .01$.

6.5.2 Cross-level relationships

We also examined how direct-consensus team PsyCap related to individual-level job satisfaction and individual-level turnover intent. Model 1a (Table 6-4) indicates that direct-consensus team PsyCap was not significantly related to individual-level job satisfaction (β = .59, *n.s.*). In contrast, referent-shift team PsyCap was significantly related to individual-level job satisfaction (β = 1.48, $p <$ .01; Model 1b in Table 3). Similarly, direct-consensus team PsyCap level was not significantly related to individual employee turnover intent (β = -1.45, *n.s.*), but referent-shift team PsyCap was (β = -4.98, $p <$ .01).

For each of these cross-level analyses, we also investigated the potential effect of team PsyCap strength. Neither for job satisfaction nor turnover intent was PsyCap strength found to be a significant predictor (see Table 6-4). Similarly, an interaction term of mean-centered team PsyCap level and strength did not have a significant effect on either job satisfaction or turnover intent (see Table 6-4).

Table 6-4

Summary of Cross-level Analysis: Fixed Effects Estimates and Random Effects Estimates for Predicting Job Satisfaction and Turnover Intent from Direct-Consensus and Referent-Shift Team-Level PsyCap

	JOB SATISFACTION		**TURNOVER INTENT**	
	Fixed effects			
Parameter	Model 1[a]	Model 1[b]	Model 1[a]	Model 1[b]
Intercept	12.42** (0.18)	12.46** (0.15)	10.27** (0.56)	10.16** (0.40)
Level 1				
Individual PsyCap	1.72** (0.31)	1.72** (0.31)	-3.17** (0.87)	-3.17** (0.87)
Level 2				
DC Team PsyCap Level	0.59 (0.55)		-1.45 (1.70)	
DC Team PsyCap Strength	15.44 (23.73)		23.00 (72.70)	
DC Team Level X Strength	-61.91 (64.12)		67.62 (199.42)	
RS Team PsyCap Level		1.28** (0.43)		-4.98** (1.21)
RS Team PsyCap Strength		8.23 (25.38)		45.33 (70.91)
RS Team Level X Strength		-78.21 (40.31)		173.30 (112.52)
	Random effects			
Residual Variance Intercept	0.22 (0.47)	0.03 (0.17)	3.81* (1.95)	0.053 (0.23)
Residual Variance Slope	3.90 (1.97)	3.83 (1.96)	30.70 (5.54)	30.54 (5.53)

Note [a] Team PsyCap is operationalized using direct-consensus model of aggregation; [b] Team PsyCap is operationalized using referent-shift model of aggregation; standard errors are in parentheses; DC., Direct-Consensus; RS., Referent-Shift.

6.5.3 Team-level relationships

The next series of analyses examined the relationships between team PsyCap and team-level outcomes. We conducted a series of hierarchical regression analyses with both aggregations of team PsyCap. In the first step, PsyCap level was entered into the model. In the second step team PsyCap strength was entered into the model to predict the relevant dependent variable. A team PsyCap level*strength interaction was also entered into the second step, using centered predictors, to measure potential moderating effects of team PsyCap strength. Results from these analyses are presented in table 6-5.

Direct-consensus team PsyCap was a significant predictor of team performance (β = .46, p <.01) and explained significant variance in team performance (R^2 = .22, p < .01). Team PsyCap strength in the second step was did not significantly predict team performance (β = .00, *n.s.*). Moreover, team PsyCap strength did not moderate the relationship between direct-consensus team PsyCap level and team performance (β = -.14, *n.s.*).

Similar results patterns emerged for referent-shift team PsyCap. Referent-shift team PsyCap level was found to be a significant predictor of team performance (β = .69, p < .01), but neither PsyCap strength significantly predicted team performance (β = .15, *n.s.*), nor did it moderate the relationship between referent-shift team PsyCap level and team performance (β = -.14, *n.s.*).

Looking at team satisfaction, direct-consensus PsyCap level was a significant predictor (β = .45, p <.01) and explained significant variance in team satisfaction (R^2 = .21, p < .01), but team PsyCap strength was not a significant predictor of team satisfaction (β = .05, *n.s.*). Furthermore, team PsyCap strength did not moderate the

relationship between direct-consensus team PsyCap level and team satisfaction (***β*** = -.27, *n.s.*).

Referent-shift team PsyCap could also significantly predict team satisfaction (***β*** = .62, $p < .01$). Moreover, team PsyCap strength was also found to be a significant predictor of team satisfaction (***β*** = .26, $p < .05$), and adding PsyCap strength significantly improved the model ($\Delta R^2 = .07$, $p < .05$). However, team PsyCap strength did not moderate the relationship between referent-shift team PsyCap and team satisfaction (***β*** = -.18, *n.s.*).

Referent-shift team PsyCap also significantly predicted team relationship conflict (***β*** = -.35, $p < .05$), but team PsyCap strength was not (***β*** = -.18, *n.s.*). Similarly, team PsyCap strength did not have a moderating effect on the relationship between referent-shift team PsyCap level and team relationship conflict (***β*** = .08, *n.s.*). All other team-level outcomes were not significantly predicted by team-level PsyCap level or strength of either aggregation.

Table 6-5

Regression Analysis for Team Level Relationships with Each Model of Aggregation of Team PsyCap

	Direct-Consensus Team PsyCap				Referent-Shift Team PsyCap			
	β	R^2	ΔR^2	*F*	*B*	R^2	ΔR^2	*F*
Team Performance								
Step 1		.22	.22	11.24**		.51	.51	42.08
Team PsyCap Level	.46**				.69**			
Step 2		.22	.00	.00		.53	.02	1.97
Team PsyCap Strength	.00				.15			
Team PsyCap Level X Strength	-.14				-.14			
Team Satisfaction								
Step 1		.21	.21	11.13**		.43	.43	30.50**
Team PsyCap Level	.45**				.62**			
Step 2		.22	.002	.10		.49	.07	5.43*
Team PsyCap Strength	.05				.26*			
Team PsyCap Level X Strength	-.27				-.18			

continued

	Direct-Consensus Team PsyCap				Referent-Shift Team PsyCap			
	β	R^2	ΔR^2	*F*	*B*	R^2	ΔR^2	*F*
Team Task Conflict								
Step 1		.00	.00	.04		.05	.05	2.20
Team PsyCap Level	.00				-.21			
Step 2		.01	.01	.30		.07	.02	.70
Team PsyCap Strength	-.09				-.13			
Team PsyCap Level X Strength	-.20				-.04			
Team Relationship Conflict								
Step 1		.04	.04	1.81		.14	.14	6.40*
Team PsyCap Level	-.19				-.35*			
Step 2		.04	.002	.08		.17	.03	1.60
Team PsyCap Strength	-.05				-.18			
Team PsyCap Level X Strength	.02				.08			

Note. Betas reported from final model at Step 2; *p <.05, **p<.01

6.6 Discussion

Following recent calls to extend PsyCap research beyond individual-level of analysis (Luthans, Youssef et al., 2007; Youssef & Luthans, 2011) this study examined how different operationalizations of team PsyCap influenced both team- and individual-level outcomes. Specifically, we have extended previous team-level PsyCap by exploring the relationships team PsyCap has with outcomes associated with employee functioning and well-being, including job satisfaction, turnover intent and team conflict. We found significant associations at both levels, particularly when referent-shift team PsyCap was employed. We also investigated how team PsyCap strength affected the prediction of these outcomes, with analyses revealing that team PsyCap strength added little significant influence in the prediction of outcomes.

6.6.1 Individual-Level Relationships

At the individual-level, we found a significant and positive relationship between individual-level PsyCap and employee job satisfaction. This finding corroborated previous research demonstrating positive correlations between individual-level PsyCap and job satisfaction (e.g. Cheung et al., 2011; Luthans, Avolio et al., 2007), and more broadly, employee well-being (e.g. Luthans, Avolio et al., 2007). Similarly, our study demonstrated that individual-level PsyCap is a protective factor against employee turnover intentions. This finding is also consistent with previous research (e.g. Avey, Luthans & Youssef, 2010). Given that both job satisfaction and turnover intentions are significant predictors of *actual* organizational turnover (Crossley, Bennett, Jex & Burnfield, 2007), our individual-level findings again highlight the importance for organizations to be cognizant of the beneficial effect PsyCap can have in terms of greater employee commitment to the organization and reduced costs and burden associated with staff turnover.

Moreover, job satisfaction has a demonstrated positive relationship with employee psychological health (Cotton & Turtle, 1986) and affective well-being (Van Katwyk, Fox, Spector & Kelloway, 2000), while job turnover has been attributed to poorer psychological functioning in employees (Wright & Bonett, 1992). Thus, these findings further demonstrate the benefits of PsyCap in terms of promoting positive employee well-being and psychological functioning. Lastly, by conducting these analyses in a multilevel environment, our study adds to previous literature in that it controls for team clustering effects in both the dependent and independent variables.

6.6.2 Cross-level Relationships

Overall the cross-level analyses revealed that employees from teams with greater levels of team-referent PsyCap reported higher job satisfaction and lower turnover intentions than employees from teams with lower team-referent PsyCap. However, when these same relationships were analyzed using the direct-consensus model of aggregation for team PsyCap, no significant cross-level results were found. Thus, similarity of individual-referent PsyCap within teams had no significant influence on individual employee job satisfaction or turnover intent.

These findings add to the literature in two ways. First, these results demonstrate the beneficial value of being part of a positively-oriented team in terms of heightened employee job satisfaction and lower turnover intentions. These relationships, in turn, could have broader, flow on effects to employee well-being and psychological health, as well as reduced organizational costs associated with job-related dissatisfaction and turnover. Second, in respect to measurement, this was the first study to examine potential cross-level relationships between team PsyCap and individual-level outcomes. The findings provide important insights into the

operationalization and effects of PsyCap at the collective level. Specifically, the analyses from this study generally provide support for the criterion validity of a referent-shift operationalization of team PsyCap. This is a substantial finding in itself, as this issue has not previously been explored within the PsyCap literature, despite both modes of aggregation being implemented for the operationalization of team PsyCap.

Debate regarding the most appropriate mode of operationalization for aggregated constructs has characterized related areas of study, such as collective efficacy (Baker, 2001; Hardin, Fuller & Valacich, 2006). Although we do not aim to assume that the referent-shift model of aggregation is the only way to conceptualize and operationalize team PsyCap, it appears that in relation to the outcomes of interest in this study it is the superior mode of aggregation for team PsyCap in relation to criterion validity.

6.6.3 Team-Level Relationships

This study was the first to examine effects of team PsyCap using both the direct-consensus and referent-shift aggregation approaches to explore potential differential effects of team PsyCap on team-level outcomes. Team-level PsyCap was significantly and positively related to team performance and team satisfaction, regardless of the team PsyCap measurement model. These findings are consistent with previous team PsyCap research investigating direct-consensus team PsyCap and team performance (Peterson & Zhang, 2011), and referent-shift team PsyCap and team performance (Walumbwa et al., 2011); as well as research investigating referent-shift team positivity and team satisfaction (West et al., 2009).

We found differential effects of the PsyCap aggregation methods on team conflict. Direct-consensus team PsyCap was not significantly related to either team

task or relationship conflict, but referent-shift team PsyCap could predict team relationship conflict. This suggests that the aggregation of individuals' PsyCap has little bearing on the degree of conflict within teams, but the explicit reference of PsyCap on the team has. Teams with higher team-referent PsyCap might be better able to recover from setbacks such as within-team conflict, seek out alternate pathways to achieve goals when a chosen pathway becomes ineffective; and remain positively focused during adversity. Therefore, these teams are less likely to experience relationship conflict. This is in alignment with West et al. (2009) who demonstrated significant, negative associations between team-level psychological capacities (resilience, efficacy and optimism) and team conflict.

We found no significant relation between referent-shift team PsyCap and team task conflict. While this relationship has not previously been examined with overall team-level PsyCap, the finding is inconsistent with West et al. (2009) who found that the combination of team-level efficacy, optimism and resilience could predict reported team conflict. However, given that team task conflict can have beneficial effects on team functioning, our finding is not entirely unexpected. For example, Jehn and Mannix (2001) found that high performing teams experience more task conflict and less relationship conflict. Similar to intragroup trust (Simons & Peterson, 2000), team PsyCap might moderate the relationship between team task conflict and team relationship conflict, thereby allowing teams to benefit from positive conflict (i.e. task conflict) and avoid negative conflict (i.e. relationship conflict). However, this proposition needs further investigation in future research.

6.6.4 Team PsyCap Strength

This is the first study to examine PsyCap strength. The operationalization of team PsyCap strength is based on previous team-based climate literature (Colquitt et

al., 2002; Lindell & Brandt, 2000). Our results indicate that referent-shift team PsyCap strength can predict team satisfaction, over and above team PsyCap level. However, no other individual- or team-level outcome was associated with team PsyCap strength. This suggests that team PsyCap level might be a sufficient indicator of a team's resources in predicting adaptive outcomes, and that additional measures of team heterogeneity do not add to this explanation.

This is somewhat consistent with Lindell and Brandt's (2000) findings which failed to reveal significant direct or moderating effects of justice climate strength. We only found a significant effect for team PsyCap strength in the prediction of team satisfaction when referent-shift team PsyCap was employed. One potential explanation is that team members are more likely to provide consensual ratings of team PsyCap when the referent is focused on the team, rather than on the individual team member. Thus, it would be expected that a referent-shift operationalization of team PsyCap would promote greater team PsyCap strength, which in turn, would predict a greater degree of variance in team-level outcomes, such as satisfaction. Further research implementing samples of teams with greater variation in team PsyCap strength is needed to confirm this proposition.

6.7 Limitations

There are limitations to our findings worth considering. The cross-sectional design of this study does not allow for interpretation of causality. However, our interpretations regarding the relationship between team PsyCap and team performance and PsyCap and job satisfaction, turnover intentions and conflict are consistent with longitudinal PsyCap research (Walumbwa et al., 2011) and meta-analysis findings (Avey et al., 2011). Regardless, future research would benefit from examining the different relationships direct-consensus and referent-shift team

PsyCap level and strength have on individual- and team-level outcomes across time. Moreover, although a strength of this study was the use of *in situ* work teams, it must be noted that the study employed non-probability, convenience sampling. While this method is commonly employed in PsyCap research (i.e. Avey et al., 2008; Jensen & Luthans, 2006), it constrains the generalizability of the findings. Future studies should employ random sampling techniques.

The findings of this study may also be susceptible to common method bias because data was collected using self-report, single-source methods (Podsakoff, Mackenzie, Lee & Podsakoff, 2003; Spector, 2006). Given that some of the variables in this study are subjective in nature (e.g. PsyCap, job satisfaction and turnover intentions) they are arguably best evaluated by self-report (Spector, 2006). However, the use of self-report measures for performance is considered problematic given that individuals are likely to hold favorable views of their own performance or that of their team (Van der Heijden & Nijhof, 2004). Although surveys in this study were completed anonymously, thereby making responses potentially less vulnerable to social desirability bias (Podsakoff et al., 2003); objective ratings of team performance should be included in future research examining outcomes of team PsyCap.

6.8 Implications

At a most basic level the findings demonstrate the significant relationships team PsyCap has with performance, satisfaction and conflict at the team-level. Moreover, the study goes beyond previous team PsyCap research by demonstrating that team PsyCap can also have significant influence on individual employee outcomes, including job satisfaction and turnover intentions. Given that both job satisfaction and job turnover have been found to influence employee psychological

functioning, we suggest that being part of a positively-oriented work team could provide a buffer against potential distress and anxiety associated with job dissatisfaction and desire to leave a job.

The results support a referent-shift operationalization of team PsyCap. Thus, when team members consider the psychological capacities of their team, greater insight is garnered about the influence of team PsyCap on outcome variables than when team members are asked about their perceptions of their own psychological capacities. This finding contributes to team PsyCap theory development and provides clarification regarding the operationalization and measurement of team PsyCap in in-situ work teams.

In terms of practice, the results highlight the importance of fostering PsyCap within teams, not only to enhance team performance and functioning but also individual employee functioning and well-being. Thus, our findings point to the potential for training interventions aimed at bolstering team PsyCap, similar to those aimed at developing individual PsyCap (Luthans, Avey, Avolio & Peterson, 2010). However, we suggest the benefits team PsyCap interventions could be more encompassing than interventions focused on individual employees, as both team and employee functioning may be enhanced. This means that for PsyCap, group-level interventions may be far more effective than interventions focusing solely on the individual.

6.9 Conclusion

Team-level PsyCap is an emergent field of research concerned with the shared psychological capacities of work teams. Although previous research has demonstrated positive associations with team-level outcomes this research has been divergent in terms of its operationalization of team PsyCap. Moreover, potential

cross-level effects of team PsyCap have not been examined. This study employed a multilevel approach to examine relationships between team PsyCap and team- and individual-level outcomes. In conducting our analyses we compared two composition models of aggregation, with results supporting a referent-shift operationalization of team PsyCap in the prediction of both individual- and team-level outcomes. The notion of team PsyCap strength was also introduced to explore the degree to which team consensus regarding perceptions of team PsyCap moderates these relationships. However, results indicated that team PsyCap strength demonstrated little significant influence in the relationship between team PsyCap and the outcomes examined. The results from this study not only contribute to team-level PsyCap theory development and measurement clarification, but also offer important insights for organizational psychology practice in terms of the benefits of fostering team PsyCap to enhance both team and employee work-related functioning and well-being.

6.10 Post Script

In this chapter we demonstrated significant associations between team PsyCap and both individual- and team-level outcomes. These relationships were stronger when a referent-shift operationalization of team PsyCap was implemented. This represents an important finding for collective PsyCap research, as previous studies have been divergent in approaches used to aggregate PsyCap to the team-level. These findings also suggest membership of a positively-oriented team may not only enhance aspects of team performance and functioning but also individual employee functioning, highlighting the importance of fostering and developing team-level positivity.

This chapter concludes the series of studies that comprised this thesis. The next and final chapter draws together the key contributions of this body of work and

sets it in the context of important limitations and directions for future research that builds upon these contributions.

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Chapter 7: Discussion

This thesis encompassed theoretical and empirical research approaches to investigate and extend the utility of the POB construct of PsyCap. Specifically, Chapters 3 and 5 were conceptual and literature-based in nature and undertook analysis of the PsyCap construct in terms of its theoretical and psychometric groundings at both an individual- and collective-level. Chapter 3 employed a psychometric-focused systematic review to provide a critical and synthesized analysis of the PsyCap construct, in terms of its theoretical conceptualization and psychometric properties. Chapter 5 provided a theoretical analysis of the conceptual frameworks pertinent to extant conceptualizations of collective PsyCap and extended current collective PsyCap theory by proposing alternate conceptualizations.

Chapters 4 and 6 incorporated field data collected in two independent empirical studies in order to examine the operationalization of PsyCap at both the individual- and collective-levels of analysis (respectively). Chapter 4 examined the criterion validity of two alternative models of PsyCap in relation to SME owner/manager job tension and job satisfaction. Chapter 6 was concerned with team-level conceptualizations and operationalizations of PsyCap and the influence of team PsyCap on both individual- and team-level outcomes.

7.1 Key findings and unique contributions to the literature

7.1.1 Identification of theoretical and psychometric shortcomings of the PsyCap construct

Chapter 3 provided the first known systematic review of the PsyCap construct in terms of its conceptual and psychometric foundations. Importantly, this chapter formed the first published review of the PsyCap construct outside of the founding

PsyCap research team; contributing a critical extension to the PsyCap literature by providing an independent analysis of the construct.

The review revealed several shortcomings pertaining to the PsyCap construct and its primary measure, the Psychological Capital Questionnaire (PCQ; Luthans, Youssef & Avolio, 2007). These areas of weakness included: 1) underdeveloped theory and investigation affirming the state-like nature of each of the components of PsyCap and potential interplay with related trait-like constructs; 2) limited evidence regarding the reliability of the PsyCap construct across time; 3) narrow assessment of the discriminant and convergent validity of the overall PsyCap construct and its individual constituents; and 4) limitations pertaining to the current measurement of PsyCap using the PCQ. Subsequently, six directives were generated to provide an informed agenda aimed towards strengthening the conceptualization and measurement of the PsyCap construct.

7.1.2 Demonstrated added utility of a four-factor model of PsyCap in the prediction of job-related outcomes and understanding the mechanisms of effect of PsyCap

Chapter 4 directly addressed one of the six directives for future PsyCap research proposed in Chapter 3. Specifically, Chapter 4 investigated the utility of analyses using the individual component scores of PsyCap in comparison to exclusively using a composite PsyCap score in the prediction of job-related outcomes. Using confirmatory factor analysis and structural equation modeling, the study demonstrated that the four-factor model provided greater explained variance compared to a second-order model of PsyCap (whereby the composite score was used) in relation to SME owner/manager job satisfaction and job tension. Moreover, differences emerged in relation to the contribution of each of the four PsyCap factors

in the explained variance in each outcome variable. These findings are consistent with previous research (Rego, Marques, Leal, Sousa & Cunha, 2010) and demonstrate the additional benefit of considering the individual components in analyses of PsyCap in terms of understanding the mechanisms of effect of PsyCap.

Additionally, this study has extended PsyCap research into a new organizational setting (the SME sector). To date, PsyCap research has largely focused on employees working in mid- to large-sized companies and organizations. Thus, this study provides some support for the generalizability of the effects of PsyCap in a different context than has been investigated in previous research.

Furthermore, as discussed in Chapter 4, the very nature of SMEs can expose individuals working in this sector to unique challenges and job demands; including multiple role responsibilities, financial stressors, long working hours and limited human resources and organizational support (Cocker, Martin, Scott, Venn & Sanderson, 2013). Prolonged exposure to these types of job demands can increase psychological distress associated with burnout, decreased job satisfaction, anxiety, depression and impaired well-being (Bakker & Demerouti, 2007). The findings presented in Chapter 4 provide further understanding for how psychological resources (i.e. PsyCap) may offer a safeguard against the effects of job strain and promote the well-being of individuals working in the SME sector. The study also highlights the opportunity to implement interventions such as the PsyCap Intervention (PCI; Luthans, Avey, Avolio, Norman & Combs, 2006), as a way of enhancing the capacity of owner/managers to deal with the challenges and stressors inherent to working within the SME sector. Thus more broadly, the research presented in Chapter 4 contributes to the literature regarding SME owner/manager

well-being; which is an acknowledged priority for occupational health research (Cocker et al., 2013; Murphy, 2007).

7.1.3 Development of a multilevel-multireferent framework for collective PsyCap

The theoretical analysis presented in Chapter 5 provided the first in-depth exploration of the conceptual underpinnings of collective PsyCap as it has been studied to date. Emerging studies have demonstrated initial empirical support for the notion of a collective PsyCap construct (Clapp-Smith, Vogelgesang & Avey, 2009; Peterson & Zhang, 2011; Walumbwa, Luthans, Avey & Oke, 2011). However, this analysis revealed that these studies were divergent in their approach to the conceptualization and measurement of collective PsyCap. This is an important finding as different operationalizations of collective constructs can result in the development of distinct constructs; each of which potentially have unique relationships with outcome measures (Guzzo, Yost, Campbell & Shea, 1993).

Chapter 5 built on these findings by integrating alternative bodies of theory and corresponding operationalizations to develop a multilevel-multireferent framework for collective PsyCap. The framework, which incorporated Chan's (1998) composition model typology, serves to: 1) provide greater alignment between theory, conceptualization and operationalization of PsyCap at higher level of analysis, by introducing alternate forms of PsyCap; and 2) provide preliminary terminology so as to reduce the ambiguity and inaccurate interchangeability of terms in relation to the aggregation of PsyCap to higher levels.

Consequently, four distinct forms of collective PsyCap have been proposed: *Summated PsyCap, Assimilated PsyCap, Team PsyCap and PsyCap Strength.* Each has been developed using relevant theory, and each reflects a different mode of operationalization and measurement. It was further theorized that each form of

collective PsyCap relates differently to specific antecedent and outcome variables. Consequently, a series of testable research propositions was provided to guide future research investigating PsyCap at higher levels of analysis. As such, the multilevel-multireferent framework and proposed forms of collective PsyCap are not positioned as *fait accompli*, but rather as an evolving model which aims to 'map out' potential formations of collective PsyCap and develop a greater understanding of how PsyCap may emerge and operate at higher-levels.

7.1.4 Comparison of two compositional approaches in a cross-level model of team PsyCap and individual employee and work team functioning

Following on from the directives for future research presented in Chapter 5, Chapter 6 investigated the viability of different compositional models for operationalizing team PsyCap. Using hierarchical linear modeling, the study compared two compositional models of aggregation (direct-consensus and referent-shift; Chan, 1998) to represent the construct of team PsyCap. Although both these models of aggregation have been used in previous team PsyCap research (Clapp-Smith et al., 2009; Peterson & Zhang, 2011; Walumbwa et al., 2011), this is the first known study to directly compare the two approaches in relation to the prediction of outcomes variables.

Additionally, this study provided further unique contribution to the literature by providing the first known analysis of the cross-level influence of team PsyCap on both team- and individual-level outcomes. Thus, it represents the first truly multilevel (Bliese & Jex, 2002) PsyCap study and enabled the development of a meso-paradigm (House, Rousseau & Thomas-Hunt, 1995) in relation to PsyCap, by investigating variables spanning more than one level of analysis.

Chapter 6 revealed significant associations between team PsyCap and individual- and team-level outcomes, particularly when a referent-shift operationalization of team PsyCap was employed. In particular, team PsyCap was found to be positively related to measures of performance and satisfaction at the team-level and negatively associated with team conflict. These findings were consistent with previous research which has investigated the relationship between team-level PsyCap and team performance (Walumbwa et al., 2011). Team PsyCap was also found to have significant influence on individual-level outcomes, including job satisfaction and turnover intentions. Chapter 6 also demonstrated that the degree to which team members were similar in their team PsyCap perceptions (*PsyCap Strength*) had little significant influence in the prediction of outcomes.

7.2 Theoretical and practical implications

The research has several important theoretical and practical implications. Broadly, from a research perspective, the implications derived from this research center on improving the conceptualization and psychometric foundations of the PsyCap construct at both the individual- and team-levels of analysis. Practical implications relate to expanding the utility of the both individual- and team-level PsyCap, particularly in relation to human resource development approaches.

7.2.1 The development of a research agenda designed to strengthen the conceptualization and measurement of PsyCap and enhance its utility in the workplace

Chapter 3 provided a series of directives to guide future PsyCap research and improve the conceptualization and measurement of the construct. From a research perspective, endorsement of this research agenda will further establish PsyCap as a meaningful organizational behavior construct. Specifically, improved clarity

regarding the state-like conceptualization of PsyCap (and its individual constituents) and an enhanced psychometric profile which explicitly differentiates PsyCap from other seemingly similar constructs such as positive affect, well-being and core-self evaluations (CSEs) will assist in moving the field forward. These contributions build on previous critiques of the PsyCap construct (Little, Gooty & Nelson, 2007), and more generally, of the POB paradigm (e.g. Hackman, 2009). Additionally, it is envisaged that further development and clarity regarding the theoretical and psychometric underpinnings of the PsyCap construct will stimulate interest in the construct from a broader spectrum of researchers.

Several practical implications also stem from the research agenda provided in Chapter 3. First, by developing an understanding regarding potential moderating and mediating relationships between the state-like components of PsyCap and their trait-like counterparts, managers could more readily identify employees whose functioning could be improved by developing their state-like PsyCap. Second, improved psychometrics and measurement procedures will ensure more accurate assessment of employee PsyCap. Consequently, managers or HRD specialists will be better positioned to determine the need for and utility of PsyCap interventions for their staff. Third, routine implementation and analysis of the individual PsyCap component scores will allow identification and prioritization of the specific PsyCap components most relevant to individual employees and work teams' tasks. Finally, PsyCap profiling may also provide managers, HR personnel and Employee Assistance Program providers with a more comprehensive picture of employee positivity and likely areas of strength.

7.2.2 Endorsement of a four-factor model of PsyCap to enhance criterion validity and understanding of the mechanisms of effect of PsyCap

Chapter 3 proposed that the use of ancillary analyses incorporating the individual component scores of PsyCap may provide increased criterion validity and contribute to understandings regarding the effect mechanisms of PsyCap. Chapter 4 followed on from this directive by demonstrating that criterion validity improved when the PsyCap components were considered independently, rather than as a composite PsyCap factor, in relation to predicting SME owner/manager job satisfaction and job tension. This finding is in alignment with previous research which demonstrated that job performance was better predicted when the PsyCap components were considered individually (Rego et al., 2010). Taken together, these findings suggest that researchers may risk losing predictive power of outcome variables if they neglect the distinction between the individual PsyCap components.

Consideration of a four-factor model of PsyCap also holds important practice implications. Most notably, this model allows for determining which PsyCap factors are most important in relation to particular outcome variables. Thus, organizations can identify which are the most relevant PsyCap capacities to their workplace based on those outcomes most pertinent to the organization's functioning. As such, more tailored interventions aimed at enhancing those particular PsyCap capacities could be developed and implemented. Similarly, by considering the four factors of PsyCap independently, greater insight could also be developed regarding potential organizational factors (e.g. performance appraisal procedures; Rego et al., 2010) that enhance or inhibit particular facets of PsyCap, which in turn positively (or negatively) influence aspects of employee functioning.

7.2.3 A multilevel-multireferent framework of collective PsyCap designed to guide future research and enhance its application in the workplace

Chapter 5 responded to recent calls for investigation of PsyCap as a collective construct (Luthans et al., 2007; Youssef & Luthans, 2011) by providing an analysis of theory and measurement issues pertaining to multilevel conceptualization and operationalization. The new framework proposed is aimed towards stimulating and guiding future multilevel PsyCap research in several ways. First, it will foster greater alignment between theory, conceptualization and operationalization of PsyCap at higher levels of analysis by introducing alternate forms of collective PsyCap. As the framework adheres to Kozlowski & Klein's (2000) principles for multilevel theory development, it specifies the *what, how, when, where and why* relevant to collective PsyCap. Second, the framework provides preliminary terminology which serves to reduce the ambiguity and inconsistency of terms in relation to the aggregation of PsyCap to higher levels evidenced in previous research (e.g. Clapp-Smith et al., 2009; Peterson & Zhang et al., 2011).

The development of a multilevel-multireferent framework also holds important implications for practice. Most notably, it provides an initial 'mapping out' of how the various forms of collective PsyCap may emerge in relation to specific antecedents and individual-level, team-level and organizational-level outcomes differently. Empirical validation of this framework would demonstrate enhanced utility of PsyCap at higher levels of analysis; particularly in relation to team selection and composition, and team development. This in turn could hold important implications for organizations in terms of developing and maximizing the potential of their teams.

7.2.4 Improved clarity regarding the operationalization and measurement of team PsyCap and its cross-level effects on employee functioning

The findings from Chapter 6 revealed significant associations between team-level PsyCap and both individual-level (job satisfaction and turnover intentions) and team-level outcomes (performance, satisfaction and conflict). These relationships were significantly stronger when a referent-shift operationalization of team PsyCap was implemented. Thus, greater understanding regarding the influence of team PsyCap on outcome variables is achieved when team members are asked to reflect specifically on their team's shared capacities, rather than amalgamating team members' individual perceptions regarding their own individual psychological capacities. This represents an important finding for collective PsyCap research, as previous studies have been divergent in the operational approach used to aggregate PsyCap to the team-level. Therefore, the results from this study contribute to team PsyCap theory development by providing clarification regarding the operationalization and measurement of team PsyCap in in-situ work teams.

This is also the first study to demonstrate cross-level effects of team PsyCap; revealing that the positive benefits of team PsyCap can operate at both the individual- and team- levels of analysis. Thus, membership of a positively-oriented team may not only enhance aspects of team performance and functioning but may also extend to individual performance and functioning. These findings emphasize the importance of fostering team-level positivity in organizations; perhaps over and beyond that of individual employee positivity. Subsequently, Chapter 6 highlights the opportunity to develop training interventions aimed at bolstering team PsyCap like those aimed at developing individual PsyCap (Luthans, Avey, Avolio & Peterson, 2010). Although the individual-level PsyCap intervention has been shown

to be effective in terms of improving individuals' PsyCap and subsequent job performance (Luthans et al., 2010), it is suggested that the benefits of team PsyCap interventions could be more encompassing, as both team and employee performance and functioning may be enhanced.

7.3 Limitations and future directions

The aforementioned theoretical and practical implications need to be considered with regard for the limitations associated with this research. In particular, and as discussed in Chapter 2, there are several limitations pertaining to the data-based studies presented in Chapters 4 and 6. These include reliance on single source and self-report data, cross-sectional research designs and relatively small convenience samples. Because of these potential limitations future research should incorporate strategies to minimize common method variance, including the use of survey temporal separation, objective measures of job performance and longitudinal research designs. Moreover, future research should also attempt to employ larger sample sizes so as to improve confidence in findings.

Additionally, although Chapters 3 and 5 developed a series of directives for future research, the data-based studies in Chapters 4 and 6 were only able to address some of these directives. Thus, there are several opportunities for future research to build upon the findings reported in this thesis, which will now be outlined. Attention to these opportunities will further strengthen the theoretical and psychometric foundations of PsyCap at both the individual- and team-level and thereby enhance its utility in organizational behavior and human resource management research and practice.

First, further research is needed to affirm the nature of the individual components of PsyCap and to explore their relationships with more trait-like

conceptualizations and coping processes. Although, there is an impetus to expand the PsyCap construct so as to encapsulate other components including creativity, humor and courage (Youssef & Luthans, 2012), the findings from Chapter 3 suggest greater priority be placed on construct refinement as it currently stands.

Directly relating to this point, Chapter 3 highlighted that additional investigation of the discriminant and convergent validity of PsyCap with other seemingly similar constructs, including core self evaluations and positive affect is needed. Moreover, additional research is needed to affirm the factorial validity of the individual components of PsyCap. In particular, inconsistencies were noted between theoretical conceptualizations of PsyCap hope (comprised of agency and way power) and its purported unifactorial structure. Greater investigation is also needed to assess the test-retest reliability of PsyCap and within person variability across time using true longitudinal research designs in order to affirm the state-like nature of PsyCap. To ensure the ongoing development of the psychometric profile of the PsyCap construct, a stronger psychometric focus needs to be incorporated in all future PsyCap research and not be assumed to be the responsibility of the founding research team.

The findings from Chapter 4 suggest that future research should routinely incorporate analysis using the four-factor structure of PsyCap in order to develop greater understanding regarding the mechanisms of effect of PsyCap and the purported 'synergistic effect' of PsyCap (Luthans et al., 2007). The study in Chapter 4 reported that PsyCap optimism may be more important in the prediction of job satisfaction and job tension. Future research could build on this finding by investigating whether the components of PsyCap are differentially important in the prediction of other desirable job-related outcomes, including OCBs and

organizational commitment. This line of research could be further strengthened by employing objective dependent variable measures (e.g. manager-rated performance or archival attendance records) and longitudinal research designs so as to enable casual inferences and reduce the potential for common method variance is reduced, as discussed in Chapter 2.

Fostering a greater understanding of the mechanisms of effect of PsyCap may also help to inform further development and refinement of the current PsyCap intervention (PCI; Luthans et al., 2006). Currently, it is assumed that individuals must engage in the development of all four components of PsyCap (hope, efficacy, resilience and optimism) in order to achieve the benefits of the PCI. However, research is yet to determine whether development of all four components is in fact necessary to produce the desired effects of PsyCap development (e.g. enhanced job performance). In other words, it may be possible that by focusing on the development of one or two PsyCap components similar intervention effects could be observed as when overall PsyCap is developed (Luthans et al., 2010). This line of enquiry could result in the development of more cost- and time-effective PsyCap interventions.

Future research opportunities also remain to explore the application of the PCI to different work contexts. As outlined in Chapter 1, research to date has been limited in exploring the efficacy of the intervention within mid- to large-sized companies and organizations (e.g. Luthans, Avey & Patera, 2008; Luthans et al., 2010). Given that the interaction between setting, intervention (training) and outcomes is complex, the question of transferability of the intervention to other contexts is crucial for evidence-based research (Cambon, Minary, Ridde & Alla, 2012). Thus, further investigation is needed to determine the transferability of the

PCI to other organizational contexts, including the SME sector and to consider the potential influence of contextual predictors, moderators and outcomes in assessing the efficacy of the PCI.

More research is also needed to understand the operation of PsyCap at higher levels. In Chapter 6 support was reported for the conceptualization and operationalization of what we have termed *team PsyCap*, using a referent-shift model of aggregation. However, a basis for the conceptualization and operationalization of other forms of collective PsyCap (i.e. *summative additive PsyCap*, *assimilated PsyCap*) has also been presented in Chapter 5. Future research is needed to empirically investigate and validate these alternate forms of collective PsyCap. Specifically, discriminant and convergent validity among the proposed forms of collective PsyCap, as well as in relation to other collective constructs, such as climate and collective efficacy, needs to be established. Investigation into the emergence processes of collective PsyCap is another avenue for future research. It is suggested that team interdependency, team tenure and leadership attributes (including leader PsyCap) may be relevant antecedents.

Furthermore, as discussed in detail in Chapter 2, the multilevel study in Chapter 6 was also restricted to a cross-sectional design and relied on self-report performance data. Although extant literature tends to support the model of conceptualizing the effects of team-level PsyCap on the outcomes described in Chapter 6, a reverse casual model (e.g. team performance enhances team-level PsyCap) cannot be eliminated without the collection of longitudinal data. Thus, future research would benefit from undertaking latent growth modeling (LGM) and cross lagged analysis approaches and employing objective performance measures to overcome these limitations. LGM would enable exploration of the relationship

between team-level PsyCap and outcomes at the individual- and team-level across time. Supplementary analyses using cross lagged panel analysis would affirm causal relationships (e.g. higher team PsyCap enhances individual and/or team performance) by testing the relative fit models that specify alternate casual relationships (e.g. positive team performance leads to higher team PsyCap). A similar approach has been used to investigate the relationship between within person change in PsyCap across time and individual-level performance (Peterson, Luthans, Avolio, Walumbwa & Zhang, 2011).

As multilevel PsyCap research continues to develop, avenues arise to investigate organizational-level PsyCap and the interplay between PsyCap at multiple levels (i.e. beyond individual/team-level). Although it is generally acknowledged that positive organizational practices do not necessarily create positive individual employees or vice versa (Youssef & Luthans, 2012), there remains untapped opportunity to investigate the mechanisms that facilitate or hinder the cross-level transfer of positivity. As outlined above, this line of enquiry would require sophisticated research methodologies (e.g. growth models) so to consider the inter-relationships among constructs across various levels in a dynamic framework (e.g. changes across time). For instance, how does tenure moderate the relationship between organizational culture and employee PsyCap? Investigation of cross-level transfer of positivity will provide further understanding of the utility of PsyCap and PsyCap interventions for organizations, work teams and individual employees alike.

Finally, the multilevel framework and reported empirical findings suggest the potential for developing training interventions aimed at bolstering team PsyCap, similar to those aimed at developing individual PsyCap (Luthans et al., 2010). However, the benefits of a team PsyCap intervention could be more encompassing

than interventions focused on individual employees, as both team and employee functioning may be enhanced. Consequently, it is also possible that team PsyCap interventions may provide a greater increased return on investment (ROI) to organizations in comparison to interventions focused solely on developing individual employees' PsyCap. As such, it is recommended that future research develop and assess the efficacy of a team PsyCap intervention in terms of its impact on individual- and team-level PsyCap and subsequent performance and functioning.

7.4 Summary and conclusions

Psychological Capital (PsyCap) encapsulates an individual's positive psychological state of development by focusing on the resources of hope, self-efficacy, resilience and optimism. A body of research accumulated over the past decade has demonstrated that PsyCap is positively related to a variety of desirable job attitudes and behaviors and negatively related to undesirable organizational outcomes. However, despite publication growth, this thesis revealed several shortcomings pertaining to the conceptualization and measurement of the construct at both the individual and higher-levels of analyses. As such, the PsyCap paradigm would benefit from critical research aimed towards clarifying supporting theoretical frameworks, construct conceptualization and measurement refinement. It is suggested that attention dedicated to these aspects will further enhance the utility of the PsyCap construct in organizational behavior and human resource management research and practice.

This suggestion is exemplified by findings reported in this thesis. For instance, comparative analyses demonstrated the added utility of investigating the factors of PsyCap individually in terms of increasing predictive power and understanding the effect mechanisms of PsyCap; which in turn, could inform more

tailored PsyCap intervention practices. Additionally, by comparing alternative conceptualizations and operationalization of collective PsyCap in multilevel research, initial progress has been made towards achieving greater theoretical clarity regarding PsyCap at higher levels of analysis and its potential applications. However, continued work is needed to: 1) improve the psychometric profile of the construct; 2) develop greater understanding of the effect mechanisms of PsyCap; and 3) gain insight into the emergence and effect of PsyCap at higher levels of analysis. Finally, the development of a team-focused PsyCap intervention may represent a cost-effective organizational training resource that provides additional benefit of improving the positivity of individual employees and their respective work unit; and consequently enhancing both individual- and team-level performance and functioning.

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Appendix A: SME Owner/Manager Survey

Background information

For all of the background questions please tick one box only.

Gender: ☐ Male ☐ Female

Age: ☐ 18 – 29 ☐ 30 - 39 ☐ 40 - 49 ☐50 - 59 ☐ 60 – 69 ☐ 70+

Education: What was the highest level of education you achieved?

☐ Secondary school (high school) ☐ High school certificate (matriculation)

☐ Diploma / Associate Diploma ☐ University degree

☐ Other (please specify):_____

What type of industry is your business in?

☐ Health ☐ Mining ☐ Transport ☐ Agriculture ☐Retail

☐ Tourism ☐ Manufacturing ☐ Service Industries ☐ Building & Construction ☐ Finance ☐ Innovation, Science & Technology

☐ Wholesale ☐ Other (please specify):_____

How many employees work in your organization (full time equivalent)?

☐ 1- 4 ☐ 5-19 ☐ 20-199 ☐ More than 200

Please indicate how many employees you supervise in your current team: _____

Please read each of the following statements and indicate your opinion.

		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1.	Overall, I am satisfied with the kind of work I do.	1	2	3	4	5
2.	Overall, I am satisfied with the organization I work for.	1	2	3	4	5
3.	Overall, I am satisfied with my job.	1	2	3	4	5

Please read each of the following statements and indicate your opinion.

		Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1.	My job tends to directly affect my health.	1	2	3	4	5	6
2.	I work under a great deal of pressure.	1	2	3	4	5	6
3.	I have felt fidgety or nervous as a result of my job.	1	2	3	4	5	6
4.	If I had a different job, my health would probably improve.	1	2	3	4	5	6
5.	Problems associated with my job have kept me awake at night.	1	2	3	4	5	6
6.	I have felt nervous before attending meetings at work	1	2	3	4	5	6
7.	I often “take my job home with me: in the sense that I think about it when doing other things	1	2	3	4	5	6

Below are statements that describe how you may think about yourself right now. Use the scale below to indicate your level of agreement or disagreement with each statement.

		Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1.	I feel confident analyzing a long-term problem to find a solution.	1	2	3	4	5	6
2.	I feel confident in representing my work area in meetings with management.	1	2	3	4	5	6
3.	I feel confident contributing to discussions about the organization's strategy.	1	2	3	4	5	6
4.	I feel confident helping to set targets/goals in my work area.	1	2	3	4	5	6
5.	I feel confident contacting people outside the organization (e.g. suppliers, customers) to discuss problems.	1	2	3	4	5	6
6.	I feel confident presenting information to a group of colleagues.	1	2	3	4	5	6
7.	If I should find myself in a jam at work, I could think of many ways to get out of it.	1	2	3	4	5	6
8.	At the present time, I am energetically pursuing my work goals.	1	2	3	4	5	6
9.	There are a lot of ways around any problem.	1	2	3	4	5	6
10.	Right now I see myself as being pretty successful at work.	1	2	3	4	5	6

continued

11. I can think of many ways to reach my current work goals.	1	2	3	4	5	6
12. At this time, I am meeting the work goals I have set for myself.	1	2	3	4	5	6
13. When I have a setback at work, I have trouble recovering from it, moving on.	1	2	3	4	5	6
14. I usually manage difficulties one way or another at work.	1	2	3	4	5	6
15. I can be "on my own," so to speak, at work if I have to.	1	2	3	4	5	6
16. I usually take stressful things at work in my stride.	1	2	3	4	5	6
17. I can get through difficult times at work because I've experienced difficult before.	1	2	3	4	5	6
18. I feel I can handle many things at a time at this job.	1	2	3	4	5	6
19. When things are uncertain for me at work, I usually expect the best.	1	2	3	4	5	6
20. If something can go wrong for me work-wise, it will.	1	2	3	4	5	6
21. I always look on the bright side of things regarding my job.	1	2	3	4	5	6
22. I'm optimistic about what will happen to me in the future as it pertains to work.	1	2	3	4	5	6
23. In this job, things never work out the way I want them to.	1	2	3	4	5	6
24. I approach this job as if "every cloud has a silver lining."	1	2	3	4	5	6

Appendix B: Employee Team Survey

Background information

For all of the background questions please tick one box only.

Gender: ☐ Male ☐ Female

Age: ☐ 18 – 29 ☐ 30 - 39 ☐ 40 - 49 ☐50 - 59 ☐ 60 - 69 ☐ 70+

Education: What was the highest level of education you achieved?

☐ Secondary school (high school) ☐ High school certificate (matriculation)

☐ Diploma / Associate Diploma ☐ University degree ☐ Other (please specify):_____

Employment status: ☐ Full-time ☐ Part-time ☐ Casual

How long have you been employed in your current position? ____ years____months

Please describe the type of work you do in this position (e.g., clerical work, customer service)._____

_____

Team Size:

Please indicate how many people are in your current work team? _____

Team Tenure:

Please indicate approximately how long have you worked in your current work team by circling the appropriate option below?

☐ Less than 6 months ☐ 6 -12 months ☐ 12 -24 months

☐ 2 – 5 years ☐ 5 + years

Please read each of the following statements and indicate your opinion.

		Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
1.	Overall, I am satisfied with the kind of work I do.	1	2	3	4	5
2.	Overall, I am satisfied with the organization I work for.	1	2	3	4	5
3.	Overall, I am satisfied with my job.	1	2	3	4	5

Please read each of the following statements and indicate your opinion.

		Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
1.	I am planning to search for a new job during the next 12 months.	1	2	3	4	5	6	7
2.	I often seriously think about resigning from my job.	1	2	3	4	5	6	7
3.	If I have my own way I will leave this job to work in another organization one year from now.	1	2	3	4	5	6	7
4.	I frequently think of quitting my job	1	2	3	4	5	6	7

Below are statements that describe how you may think about yourself right now. Use the scale below to indicate your level of agreement or disagreement with each statement.

		Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1.	I feel confident analyzing a long-term problem to find a solution.	1	2	3	4	5	6
2.	I feel confident in representing my work area in meetings with management.	1	2	3	4	5	6
3.	I feel confident contributing to discussions about the organization's strategy.	1	2	3	4	5	6
4.	I feel confident helping to set targets/goals in my work area.	1	2	3	4	5	6
5.	I feel confident contacting people outside the organization (e.g. suppliers, customers) to discuss problems.	1	2	3	4	5	6
6.	I feel confident presenting information to a group of colleagues.	1	2	3	4	5	6
7.	If I should find myself in a jam at work, I could think of many ways to get out of it.	1	2	3	4	5	6
8.	At the present time, I am energetically pursuing my work goals.	1	2	3	4	5	6
9.	There are a lot of ways around any problem.	1	2	3	4	5	6
10.	Right now I see myself as being pretty successful at work.	1	2	3	4	5	6
11.	I can think of many ways to reach my current work goals.	1	2	3	4	5	6
12.	At this time, I am meeting the work goals I have set for myself.	1	2	3	4	5	6

continued

13.	When I have a setback at work, I have trouble recovering from it, moving on.	1	2	3	4	5	6
14.	I usually manage difficulties one way or another at work.	1	2	3	4	5	6
15.	I can be "on my own," so to speak, at work if I have to.	1	2	3	4	5	6
16.	I usually take stressful things at work in my stride.	1	2	3	4	5	6
17.	I can get through difficult times at work because I've experienced difficult before.	1	2	3	4	5	6
18.	I feel I can handle many things at a time at this job.	1	2	3	4	5	6
19.	When things are uncertain for me at work, I usually expect the best.	1	2	3	4	5	6
20.	If something can go wrong for me work-wise, it will.	1	2	3	4	5	6
21.	I always look on the bright side of things regarding my job.	1	2	3	4	5	6
22.	I'm optimistic about what will happen to me in the future as it pertains to work.	1	2	3	4	5	6
23.	In this job, things never work out the way I want them to.	1	2	3	4	5	6
24.	I approach this job as if "every cloud has a silver lining."	1	2	3	4	5	6

About Your Team:

Please read each of the following statements and indicate your opinion.

	None	Hardly at All	A Little	Quite a Bit	A Lot
1. How much friction is there among members in your work unit?	1	2	3	4	5
2. How much are personality conflicts evident in your work unit?	1	2	3	4	5
3. How much tension is there among members in your work unit?	1	2	3	4	5
4. How much emotional conflict is there among members in your work unit?	1	2	3	4	5
5. How often do people in your work unit disagree about opinions regarding the work being done?	1	2	3	4	5
6. How frequently are there conflicts about ideas in your work?	1	2	3	4	5
7. How much conflict about the work you do is there in your work unit?	1	2	3	4	5
8. To what extent are there differences in opinion in your work unit?	1	2	3	4	5

Please read each of the following statements and indicate your opinion.

	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
1. My team has made appropriate decisions regarding our work in this business.	1	2	3	4	5
2. The work my team has been completing has met the required standards.	1	2	3	4	5
3. My team has made sound decisions regarding our work.	1	2	3	4	5
4. The output of my team has not met the business' expectations.	1	2	3	4	5
5. My team has chosen appropriate courses of action to meet our business' requirements.	1	2	3	4	5
6. I find it personally satisfying to be a member of this team.	1	2	3	4	5
7. All in all, it is a pleasure to be a member of this team.	1	2	3	4	5
8. I am pleased to be a member of this team.	1	2	3	4	5
9. Everyone on this team wants to continue working together in the future (on this or similar projects).	1	2	3	4	5
10. I hope to stay with this team for a long time.	1	2	3	4	5
11. Nobody wants to leave this team.	1	2	3	4	5

Below are statements that describe how you may think about your team right now. Use the scale below to indicate your level of agreement or disagreement with each statement.

		Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
1.	My team is confident analyzing a long-term problem to find a solution.	1	2	3	4	5	6
2.	My team is confident in representing my work area in meetings with management.	1	2	3	4	5	6
3.	My team is confident contributing to discussions about the organization's strategy.	1	2	3	4	5	6
4.	My team is confident helping to set targets/goals in our work area.	1	2	3	4	5	6
5.	My team members are confident contacting people outside the organization (e.g. suppliers, customers) to discuss problems.	1	2	3	4	5	6
6.	My team is confident presenting information to other colleagues.	1	2	3	4	5	6
7.	If my team gets in a jam at work, we can think of many ways to get out of it.	1	2	3	4	5	6
8.	At the present time, my team is energetically pursuing my work goals.	1	2	3	4	5	6
9.	My team feels there are a lot of ways around any problem.	1	2	3	4	5	6
10.	Right now my team is pretty successful at work.	1	2	3	4	5	6
11.	My team thinks of many ways to reach our current work goals.	1	2	3	4	5	6
12.	At this time, my team is meeting the work goals we have set for ourselves.	1	2	3	4	5	6
13.	When my team has a setback at work, we have trouble recovering from it, moving on.	1	2	3	4	5	6

continued

14.	My team usually manages difficulties one way or another at work.	1	2	3	4	5	6
15.	My team members can be "on their own" (work independently) so to speak, if they have to.	1	2	3	4	5	6
16.	My team usually takes stressful things at work in stride.	1	2	3	4	5	6
17.	My team can get through difficult times at work because as a team we have experienced difficult before.	1	2	3	4	5	6
18.	My team can handle many things at a time at this job.	1	2	3	4	5	6
19.	When things are uncertain for my team at work, we usually expect the best.	1	2	3	4	5	6
20.	My team generally feels that if something can go wrong for us work-wise, it will.	1	2	3	4	5	6
21.	My team always looks on the bright side of things regarding our job.	1	2	3	4	5	6
22.	My team is optimistic about what will happen to our team in the future as it pertains to work.	1	2	3	4	5	6
23.	My team feels in this job, things never work out the way we want them to.	1	2	3	4	5	6
24.	My team approaches this job as if "every cloud has a silver lining."	1	2	3	4	5	6

Appendix C: Confirmatory factor analysis data input and output for second-order model of PsyCap and job satisfaction

Factor BY Item	Estimate	S.E.	Est./S.E.	Two Tailed P-Value
Efficacy BY				
Efficacy1	1.00	0.00	999.00	999.00
Efficacy2	1.26	0.10	12.50	0.00
Efficacy3	1.30	0.11	11.70	0.00
Efficacy4	1.22	0.11	11.23	0.00
Efficacy5	1.10	0.11	9.90	0.00
Efficacy6	0.84	0.10	9.14	0.00
Hope BY				
Hope1	1.00	0.00	999.00	999.00
Hope2	1.30	0.13	9.70	0.00
Hope3	1.10	0.11	10.10	0.00
Hope4	1.33	0.12	10.92	0.00
Hope5	1.12	0.10	11.30	0.00
Hope6	1.14	0.12	9.60	0.00
Resilience BY				
Resilience1	1.00	0.00	999.00	999.00
Resilience2	1.11	0.15	7.20	0.00
Resilience3	0.83	0.20	5.35	0.00
Resilience4	1.20	0.20	7.21	0.00
Resilience5	1.15	0.20	7.12	0.00
Resilience6	1.10	0.16	6.64	0.00
Optimism BY				
Optimism1	1.00	0.00	999.00	999.00
Optimism2	0.84	0.12	6.82	0.00
Optimism3	1.13	0.10	11.23	0.00
Optimism4	1.11	0.11	10.30	0.00
Optimism5	0.70	0.12	5.80	0.00
Optimism6	1.13	0.11	10.12	0.00
JobSat BY				
JobSat1	1.00	0.00	999.00	999.00
JobSat2	0.91	0.06	14.70	0.00
JobSat3	0.99	0.10	14.71	0.00
PsyCap BY				
Efficacy	1.00	0.00	999.00	999.00
Hope	1.12	0.14	8.10	0.00
Resilience	0.80	0.13	6.11	0.00
Optimism	0.93	0.13	7.24	0.00

Note. Est., Estimate; JobSat., Job Satisfaction; S.E., Standard Error

Appendix D: Confirmatory factor analysis data input and output for four-factor model of PsyCap and job satisfaction

Factor BY Item	Estimate	S.E.	Est./S.E.	Two Tailed P-Value
Efficacy BY				
Efficacy1	1.00	0.00	999.00	999.00
Efficacy2	1.25	0.10	12.50	0.00
Efficacy3	1.28	0.11	11.70	0.00
Efficacy4	1.22	0.11	11.27	0.00
Efficacy5	1.08	0.11	9.91	0.00
Efficacy6	0.83	0.09	9.16	0.00
Hope BY				
Hope1	1.00	0.00	999.00	999.00
Hope2	1.30	0.13	9.72	0.00
Hope3	1.06	0.11	10.10	0.00
Hope4	1.32	0.12	10.94	0.00
Hope5	1.11	0.10	11.33	0.00
Hope6	1.13	0.12	9.60	0.00
Resilience BY				
Resilience1	1.00	0.00	999.00	999.00
Resilience2	1.09	0.15	7.30	0.00
Resilience3	0.81	0.15	5.40	0.00
Resilience4	1.20	0.16	7.34	0.00
Resilience5	1.12	0.16	7.21	0.00
Resilience6	1.10	0.16	6.74	0.00
Optimism BY				
Optimism1	1.00	0.00	999.00	999.00
Optimism2	0.90	0.12	7.00	0.00
Optimism3	1.12	0.10	11.26	0.00
Optimism4	1.10	0.11	10.34	0.00
Optimism5	0.74	0.12	6.06	0.00
Optimism6	1.11	0.11	10.10	0.00
JobSat BY				
JobSat1	1.00	0.00	999.00	999.00
JobSat2	0.91	0.06	14.80	0.00
JobSat3	1.00	0.07	14.80	0.00

Note. Est., Estimate; JobSat., Job Satisfaction; S.E., Standard Error

Appendix E: Confirmatory factor analysis data input and output for second-order model of PsyCap and job tension

Factor BY Item	Estimate	S.E.	Est./S.E.	Two Tailed P-Value
Efficacy BY				
Efficacy1	1.00	0.00	999.00	999.00
Efficacy2	1.30	0.10	12.46	0.00
Efficacy3	1.30	0.11	11.70	0.00
Efficacy4	1.22	0.11	11.25	0.00
Efficacy5	1.10	0.11	9.90	0.00
Efficacy6	0.83	0.10	9.14	0.00
Hope BY				
Hope1	1.00	0.00	999.00	999.00
Hope2	1.30	0.13	9.67	0.00
Hope3	1.06	0.11	10.10	0.00
Hope4	1.33	0.12	10.91	0.00
Hope5	1.12	0.10	11.30	0.00
Hope6	1.15	0.12	9.62	0.00
Resilience BY				
Resilience1	1.00	0.00	999.00	999.00
Resilience2	1.10	1.15	7.25	0.00
Resilience3	0.82	0.15	5.40	0.00
Resilience4	1.20	0.20	7.30	0.00
Resilience5	1.13	0.20	7.20	0.00
Resilience6	1.10	0.20	6.70	0.00
Optimism BY				
Optimism1	1.00	0.00	999.00	999.00
Optimism2	0.84	0.12	6.81	0.00
Optimism3	1.12	0.10	11.23	0.00
Optimism4	1.11	0.11	10.30	0.00
Optimism5	0.70	0.12	5.80	0.00
Optimism6	1.13	0.11	10.14	0.00
JobTen BY				
JobTen1	1.00	0.00	999.00	999.00
JobTen2	0.70	0.10	9.61	0.00
JobTen3	0.90	0.10	8.52	0.00
JobTen4	0.61	0.10	7.90	0.00
JobTen5	0.84	0.10	8.22	0.00
JobTen6	0.74	0.08	9.04	0.00
Job Ten7	0.84	0.10	8.50	0.00

continued

Factor BY Item	Estimate	S.E.	Est./S.E.	Two Tailed P-Value
PsyCap BY				
Efficacy	1.00	0.00	999.00	999.00
Hope	1.12	0.14	8.05	0.00
Resilience	0.83	0.14	6.13	0.00
Optimism	0.93	0.13	7.20	0.00

Note. Est., Estimate; JobTen., Job Tension; S.E., Standard Error

Appendix F: Confirmatory factor analysis data input and output for four-factor model of PsyCap and job tension

Factor BY Item	Estimate	S.E.	Est./S.E.	Two Tailed P-Value
Efficacy BY				
Efficacy1	1.00	0.00	999.00	999.00
Efficacy2	1.25	0.10	12.50	0.00
Efficacy3	1.30	0.11	11.70	0.00
Efficacy4	1.22	0.11	11.30	0.00
Efficacy5	1.08	0.11	9.92	0.00
Efficacy6	0.83	0.09	9.20	0.00
Hope BY				
Hope1	1.00	0.00	999.00	999.00
Hope2	1.26	0.13	9.71	0.00
Hope3	1.05	0.11	10.05	0.00
Hope4	1.33	0.12	10.94	0.00
Hope5	1.11	0.10	11.33	0.00
Hope6	1.13	0.12	9.60	0.00
Resilience BY				
Resilience1	1.00	0.00	999.00	999.00
Resilience2	1.07	0.15	7.30	0.00
Resilience3	0.81	0.15	5.41	0.00
Resilience4	1.20	0.16	7.43	0.00
Resilience5	1.11	0.15	7.24	0.00
Resilience6	1.05	0.16	6.73	0.00
Optimism BY				
Optimism1	1.00	0.00	999.00	999.00
Optimism2	0.85	0.12	6.92	0.00
Optimism3	1.11	0.10	11.30	0.00
Optimism4	1.10	0.11	10.40	0.00
Optimism5	0.71	0.12	5.91	0.00
Optimism6	1.11	0.11	10.20	0.00
JobTen BY				
JobTen1	1.00	0.00	999.00	999.00
JobTen2	0.70	0.07	9.65	0.00
JobTen3	0.90	0.10	8.51	0.00
JobTen4	0.60	0.08	7.90	0.00
JobTen5	0.84	0.10	8.20	0.00
JobTen6	0.74	0.08	9.10	0.00
Job Ten7	0.84	0.10	8.50	0.00

Note. Est., Estimate; JobTen., Job Tension; S.E., Standard Error